Journal of Physical and Chemical Reference Data

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Cite as: Journal of Physical and Chemical Reference Data **3**, 609 (1974); https://doi.org/10.1063/1.3253146
Published Online: 29 October 2009

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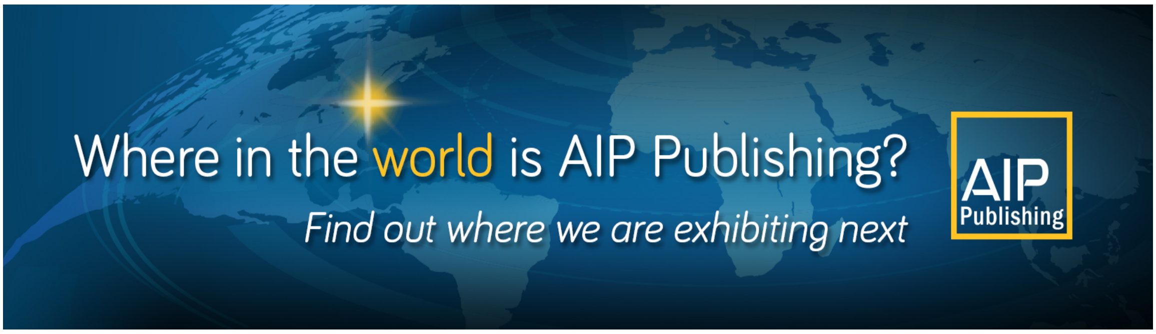

Microwave Spectral Tables
I. Diatomic Molecules

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All of the rotational spectral lines observed and reported in the open literature for 83 diatomic molecules have been tabulated. The isotopic molecular species, assigned quantum numbers, observed frequency, estimated measurement uncertainty, and reference are given for each transition reported. In addition to rectifying a number of misprints and errors in the literature cited, the spectral lines for approximately 20 molecules have been reanalyzed to produce a comprehensive and consistent analysis of all the data extracted from various literature sources. The derived molecular properties, such as rotational constants, hyperfine structure constants, electric dipole moments, rotational *g*-factors and internuclear distances are listed with one standard deviation uncertainties for all species.

Key words: Diatomic molecules; dipole moments; hyperfine structure; internuclear distance; molecular spectra; rotational constants; rotational spectral lines.

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1. Introduction

These tables represent the first part of a series of critical reviews on the microwave spectra of molecules. The present review on diatomic molecules is a revision of the Wacker, Mizushima, Peterson, and Ballard tabulation, N.B.S. Monograph 70, "Microwave Spectral Tables, Vol. I. Diatomic Molecules" [1][1]. The primary evaluation of the present critical review is directed at detecting errors, misprints, and incomplete analyses in the literature which relate to microwave spectra and molecular properties of all the diatomic species observed in the microwave frequency region. Thus, there are two goals which this review hopes to achieve: first, to provide an up-to-date and complete tabulation of the microwave spectra of diatomic molecules, and second, to provide the most precise set of molecular properties which can be derived from the observed spectra. Although the spectral line frequencies are limited to the microwave frequency region, derived molecular constants are included from a variety of sources, e.g. molecular beam electric resonance, electron paramagnetic resonance, and infrared spectroscopy, in order to provide the most complete set of data presently available. All unpublished data communicated to us privately have been included, and the open literature has been searched through June, 1973. The authors would like to receive information regarding any errors, omissions and reports on further unpublished work.

In order to reduce transcription errors and the amount of proofreading, the spectral line tables were produced directly from punched card computer input which had been carefully proofread. Due to the variability in formats, the molecular constant tables and references could not readily be handled in this fashion and were proofread separately at each stage of transcription.

1.1. General Description of the Tables

Two types of tables are presented for each molecular species. The first table contains the derived molecular constants for each isotopic species which has been studied, and the second table contains the observed microwave spectrum for all isotopic forms of the molecule. The ordering of the tables according to molecular formula follows the alphabetic sequence employed by Chemical Abstracts. Basically this method utilizes the atomic symbols as alphabetic index, for example, Ag compounds precede Al compounds resulting in the order: AgBr, AgCl, AgF, AgI, AlBr, etc. The molecular spectral data tables of section 2 are followed in section 3 with a table of the derived internuclear distances for all molecules included in the review.

Literature references are labeled with a number from one of the two systems employed here. In the first system, reference numbers range from 1 to approximately 2000 and are identical to the bibliography compiled by Favero [2]. The second system, which utilizes 5 digit numerals, has been formulated such that

[1] Numbers in brackets indicate references listed in section 1.6.

the first two digits refer to the year of publication of the reference work, while the remaining three digits correspond to a chronological ordering within the year as required for referencing purposes here. It is anticipated that this second technique, which has more degrees of freedom, will be utilized entirely in the forthcoming parts of this series on polyatomic molecules.

a. Molecular Constant Tables

Since a uniform format could not readily be constructed for these tables, they were composed in variable format depending on the type of data available. In general, the rotational constants are listed first, followed by hyperfine structure data, electric dipole moments, rotational g-factors and finally, the molecular reduced mass which was utilized in many isotopic substitution calculations. A more detailed description of the molecular constants will be given in section 1.2, 1.3, and 1.4.

b. Spectral Line Tables

The spectral tables contain all of the data intrinsic to an assigned molecular transition. The first column of these tables contain the isotopic molecular species to which the data pertain. Each isotopic species is followed by the assigned quantum numbers in the sequence: rotational, hyperfine, and vibrational. The next columns contain the observed transition frequency, its estimated uncertainty, parity when relevant, and finally the reference to the original source of the data. In all cases the quantum numbers referring to a particular transition frequency are listed with the upper energy state (primed quantum numbers) first, followed by the lower energy state designation (double primed quantum numbers). Since the vibrational state remains unchanged for all transitions, a single quantum number, v, is sufficient. In most cases the uncertainties and the transition frequency measurements are reported directly from the original reference. Since the number of significant figures beyond the decimal point was fixed in this compilation, in a few cases it was necessary to round off the measured data. This situation occurs primarily in the reproduction of molecular beam measurements. Thus, when an uncertainty of ± 0.01 MHz is quoted in the spectral line tables, the uncertainty is often less than ± 10 kHz, while a quoted uncertainty of ± 0.00 MHz generally means the uncertainty is less than ± 1 kHz. When uncertainties in the transition frequencies were not given in the original source, an uncertainty was assigned on the basis of the internal consistency of all the data available for the molecule in question.

A concerted effort was made to locate all of the essential references through mid 1973. In situations where multiple measurements have been reported, the sources not directly cited here are included as additional references at the end of the molecular constant tables. In several instances this procedure was not rigorously followed when the same transitions were reported in many publications over a period of years with improved accuracy in each case. In these cases only the more recent and most accurate citations are indicated.

1.2. $^1\Sigma$-Ground State Molecules

The majority of the diatomic molecules studied by microwave techniques have $^1\Sigma$ electronic ground states. The rotational levels of these species can be described by the quantum numbers J, F, and v as defined in section 1.2.b. Selection rules for rotational transitions observed are:

$$\Delta J = +1, \qquad \Delta F = 0, \pm 1, \qquad \text{and } \Delta v = 0.$$

a. Molecular Parameters and Energy Level Formulation

Throughout the present review the Dunham formulation [3] for the energy level expressions is employed wherever possible. In a few cases where observational data is limited, the traditional spectroscopic formulation is followed, e.g. the use of B_0, D_0, etc. Dunham's treatment shows that the energy levels can be written as:

$$W_{v,J} = \Sigma_{l,j} Y_{l,j} (v+\tfrac{1}{2})^l J^j (J+1)^j,$$

where l and j are summation indices, v and J are the vibrational and rotational quantum numbers, respectively, and the $Y_{l,j}$ are coefficients which are equivalent to the traditional spectroscopic constants from electronic band spectra, with the exception of B_e and ω_e which are defined slightly differently in the two formulations. (See ref. [3] or [4] for the exact relations). Since the isotopic dependence of these coefficients is often utilized, the following list of determinable constants summarizes the isotopic relations most often encountered:

$$Y_{10} \cong \omega_e \propto 1/\mu_r^{1/2} \qquad Y_{01} \cong B_e \propto 1/\mu_r$$

$$Y_{20} \cong -\omega_e x_e \propto 1/\mu_r \qquad Y_{11} \cong -\alpha_e \propto 1/\mu_r^{3/2}$$

$$Y_{30} \cong \omega_e y_e \propto 1/\mu_r^{3/2} \qquad Y_{21} \cong \gamma_e \propto 1/\mu_r^2$$

$$Y_{40} \cong \omega_e z_e \propto 1/\mu_r^2 \qquad Y_{02} \cong -D_e \propto 1/\mu_r^2$$

$$Y_{12} \cong \beta_e \propto 1/\mu_r^{5/2}$$

$$Y_{03} \cong H_e \propto 1/\mu_r^3$$

where the molecular reduced mass, $\mu_r = \dfrac{M_1 M_2}{M_1 + M_2}$, with M_1 and M_2 representing the atomic masses of atom 1 and 2, respectively. For a more detailed discussion of the energy level formulations for diatomic molecules, see refs. [3], [4], [5], and [6].

Following the Dunham series for the molecular energy levels, the rotational transitions for a diatomic molecule can be expressed:

$$\nu_{v, J' \leftarrow J''} = 2[Y_{01} + Y_{11}(v+\tfrac{1}{2}) + Y_{21}(v+\tfrac{1}{2})^2 + \ . \ . \ .] J'$$
$$+ 4[Y_{02} + Y_{12}(v+\tfrac{1}{2}) + \ . \ . \ .](J')^3$$
$$+ [Y_{03} + Y_{13}(v+\tfrac{1}{2}) + \ . \ . \ .][6(J')^5 + 2(J')^3].$$

An equivalent expression in terms of the tranditional constants is

$$\nu_{v, J' \leftarrow J''} = 2B_v J' - 4D_v (J')^3 + H_v[6(J')^5 + 2(J')^3]$$

where

$$B_v = B_e - \alpha_e(v+\tfrac{1}{2}) + \gamma_e(v+\tfrac{1}{2})^2 \ . \ . \ .$$

$$D_v = D_e - \beta_e(v+\tfrac{1}{2}) \ . \ . \ .$$

$$H_v = H_e \ . \ . \ .$$

Hyperfine structure is observable in a majority of the molecules tabulated here. Hyperfine structure stems from nuclear electric quadrupole interaction with the electric field gradient at the nucleus, magnetic interaction of nuclear spin with the field produced by molecular rotation, and interaction between the two nuclear spins. Basically, only the nuclear quadrupole and spin-rotation effects have been observed in microwave rotational spectra, while all of the hyperfine structure interactions of a number of diatomics have been determined from molecular beam electric resonance studies. Since the treatment of these effects can become quite complex and is often handled individually for each case, the reader is referred to the literature cited for particular formulations. Rather detailed general treatments of hyperfine structure in molecular spectra can be found in refs. [4], [5], and [7].

The most common case observed is that for diatomic molecules which contain one nucleus with nuclear spin, $I \geq 1$. In this case, the nuclear electric quadrupole and spin-rotation interactions from first order perturbation theory add to the rotational energy via:

$$W_{hfs} = -eq_v Q\, f(I, J, F)$$
$$+ (c/2)[F(F+1) - I(I+1) - J(J+1)],$$

where $f(I, J, F)$ is Casimir's function which is tabulated in Appendix I of ref. [4]. Here F is the total angular momentum quantum number, where

$$F = J+I, J+I-1, \ . \ . \ . \ |J-I|.$$

b. List of Symbols and Conversion Factors

Symbols

I (or I_i)	Angular momentum quantum number of nuclear spin for one (or *i*th) nucleus.
S	Resultant angular momentum number of electron spins. Σ is the projection of S on the molecular axis. (Hund's case(*a*)).
Λ	Absolute value of the projection of the resultant orbital angular momentum on the molecular axis. (Hund's cases(*a*) and (*b*)).
Ω	Absolute value of the projection of the total electronic angular momentum on the molecular axis.
J	Resultant angular momentum quantum number, excluding nuclear spins.
N	Resultant angular momentum quantum number, excluding electron and nuclear spins, for the case that electron spin is present.
F_1	Resultant angular momentum quantum number including nuclear spin for one nucleus.
F	Resultant total angular momentum quantum number.
X	Quantum number employed when F_1 is not a good quantum number. This value simply numbers the levels from lowest to highest energy for the same F quantum number.
v	Vibrational quantum number.
Σ, Π, Δ	Electronic state designation for which $\Lambda = 0, 1, 2$, respectively. The symbols X, A . . . precede the state designation whereby X refers to the ground state.
$Y_{l,j}$	Dunham coefficients (see text).
$'$ or $''$	Prime or double prime are used to distinguish the upper ($'$) and lower ($''$) levels in a transition. They occur as superscripts on the quantum numbers.
(. . .)	Parentheses in the numerical listings contain measured or estimated uncertainties. For example, the value 1.407(83) should be interpreted as 1.407 ± 0.083. Thus the value in parentheses refers to the last significant digits given. If X appears in parentheses, the uncertainty was indeterminate.
$\nu_{v, J' \leftarrow J''}$	Rotational transition frequency between the J' and J'' levels of the vth vibrational state (MHz).

$\omega_e, \omega_e x_e, \ldots$ Coefficients in the power series for the vibrational energy where $G=\omega_e(v+\frac{1}{2})-\omega_e x_e(v+\frac{1}{2})^2+\ldots$ (cm^{-1}).

B_e Rotational constant for the equilibrium internuclear distance. $B_e=h/8\pi^2\mu_r r_e^2$ (MHz).

$B_v, D_v, H_v \ldots$ Coefficients in the power series for rotational energy (see text).

α, γ Coefficients in the power series representing B_v (see text).

D_e, β Coefficients in power series representing D_v (see text).

μ_r Reduced mass (amu).

r_e Equilibrium internuclear distance (Å).

$eq_vQ[M]$ Nuclear electric quadrupole coupling constant of nucleus M for the vth vibrational state (MHz).

c_M Spin-rotation hyperfine structure constant related to nucleus M (kHz).

c_3, c_4 Spin-spin hyperfine structure constants. Occasionally denoted as d_T and d_S, respectively (kHz).

Conversion Factors

$$Y_{01} \cong B_e\ (\text{MHz}) = \frac{505390.98 \pm 3.5}{\mu_r r_e^2(\text{amu Å}^2)}$$

Frequency-wave number conversion factor: 29979.2458 MHz/cm^{-1}.

Atomic masses taken from: A. H. Wapstra and N. B. Gove, Nuclear Data Tables **9**, 265 (1971).

Fundamental constants taken from: B. N. Taylor, W. H. Parker, and D. N. Langenberg, Rev. Modern Phys. **41**, 375 (1969).

1.3. $^3\Sigma$-Ground State Molecules

The O_2 and SO molecules are the only diatomic molecules in this compilation which possess a $^3\Sigma$ electronic ground state. Since the energy level calculations differ quite markedly from those in section 1.2., a detailed description of the calculations will be given here. Although a number of authors have treated this problem in slightly different manners than that discussed below, for uniformity we have chosen the formulation which corresponds closest to that employed in section 1.2.

In order to describe the rotational spectra of this class, Hund's coupling case (b) was chosen as the starting point. The rotational levels are characterized by the rotational angular momentum quantum number, N, and the resultant angular momentum quantum number, J, which includes the total electron spin angular momentum. If the molecule has nuclei with non-zero nuclear spin, I, these are coupled to J to form the total angular momentum quantum number F, whereby coupling case ($b_{\beta J}$) is assumed here. For pure case ($b_{\beta J}$) the electric dipole transitions occur with the selection rules: $\Delta N=\pm 1$, $\Delta F=0, \pm 1$, and $\Delta J=0, \pm 1$, in the absence of external fields. Since an intermediate coupling case is actually observed, transitions are allowed for $\Delta N=\pm 3$. The magnetic dipole transitions occur with the selection rules: $\Delta N=0, \pm 2$ and $\Delta J=0, \pm 1$.

a. Molecular Parameters and Energy Level Formulation

The rotational energy levels may be described with the Hamiltonian [8]: $\mathcal{H}=2/3\,\lambda(3S_z^2-\mathbf{S}^2)+\gamma(\mathbf{N}\cdot\mathbf{S})+B\mathbf{N}^2$ whereby a molecule fixed cartesian coordinate system is employed with the z-axis along the molecular axis. The first term describes the spin-spin interaction, the second term refers to the spin-rotation interaction and the last term describes the rotational kinetic energy. Since the coefficients λ, γ and B are functions of the internuclear distance, r, centrifugal distortion and vibration-rotation interactions arise. If we define the coefficients as follows:

$$B=B_e(1-2\zeta+3\zeta^2+\ldots),$$

$$\lambda=\lambda_e+\lambda_{(1)}\zeta+\lambda_{(2)}\zeta^2+\ldots,$$

$$\gamma=\gamma_e+\gamma_{(1)}\zeta+\ldots,$$

where $\zeta=\frac{r-r_e}{r_e}$, the vibrational state dependence of the molecular parameters is given by:

$$B_v=Y_{01}+Y_{11}(v+\tfrac{1}{2})+Y_{21}(v+\tfrac{1}{2})^2+\ldots,$$

$$\lambda_v=\lambda_e+(2/3)\frac{B_e^3}{\omega_e^2}\lambda_{(1)}^2-\alpha_\lambda\left(v+\frac{1}{2}\right)+\ldots,$$

$$\gamma_v=\gamma_e-\alpha_\gamma(v+\tfrac{1}{2})+\ldots,$$

where the Dunham coefficients, Y_{lj}, are defined in section 1.2. and

$$\alpha_\gamma=\frac{B_e}{\omega_e}a_1\gamma_{(1)}+\ldots,$$

$$\alpha_\lambda=\frac{B_e}{\omega_e}(3a_1\lambda_{(1)}-2\lambda_{(2)}-4/3\frac{B_e}{\omega_e^2}\lambda_{(2)}^2+\ldots).$$

The centrifugal distortion terms are defined as:

$$D_v=Y_{02}+Y_{12}\left(v+\frac{1}{2}\right)+\ldots$$

$$\rho_v=4\left(\frac{B_e^2}{\omega_e^2}\right)\lambda_{(1)}-12\left(\frac{B_e^3}{\omega_e^2}\right)\lambda_{(2)}\left(v+\frac{1}{2}\right)+\ldots,$$

and

$$\delta_v=4\left(\frac{B_e^2}{\omega_e^2}\right)\gamma_{(1)}+\ldots$$

With these definitions, the rotational energy levels are given in the form [9]:

$$W_{(N=J)}=[B_v-D_vJ(J+1)]J(J+1)-[\gamma_v+\delta_vJ(J+1)] + (2/3)\,[\lambda_v+\rho_vJ\,(J+1)].$$

$$W_{(N=J\pm1)}=B_v(J^2+J+1)-D_v(J^4+2J^3+7J^2+6J+2)$$

$$-3/2\gamma_v-\frac{1}{2}\delta_v(7J^2+7J+4)-1/3\,\lambda_v-1/3\,\rho_v(J^2+J+4)$$

$$\pm\left[\left\{(2J+1)\left(B_v-2D_v(J^2+J+1)-\frac{1}{2}\delta_v\,(J^2+J+4)-\frac{1}{2}\gamma_v\right)-\frac{3\lambda_v+\rho_v(7J^2+7J+4)}{3(2J+1)}\right\}^2+4J(J+1)\left(\frac{\lambda_v+\rho_v(J^2+J+1)}{2J+1}\right)^2\right]^{1/2}$$

The sextic terms, H_v, of the rotational energy are neglected because they cannot be determined from the data presently available for the spectral observations on $^3\Sigma$ electronic ground state molecules. The energy equations are utilized with the selection rules stated above to allow the determination of the molecular constants B_v, λ_v, γ_v, D_v, ρ_v, and δ_v for vibrational state v. Combining the data available for various vibrational states allows the derivation of potential coefficients, a_i, and the expansion parameters of λ and γ.

Magnetic hyperfine structure has been described by Frosch and Foley [10] in terms of the determinable parameters, b and c. The nuclear electric quadrupole hyperfine structure is described by Amano, et al. [11] and results in determination of the constant, eq_vQ, as defined in the discussion of $^1\Sigma$ ground electronic state molecules.

b. List of Symbols

(See section 1.2.c. for additional definitions.)

a_i	Dunham potential coefficients.
λ_v	Spin-spin coupling parameter in the vth vibrational state (MHz).
α_λ	Spin-spin vibrational constant (MHz).
γ_v	Spin-rotation coupling parameter in the vth vibrational state (MHz).
α_γ	Coefficient in the power series expansion of γ_v.
ρ_v	Centrifugal distortion correction to λ_v (MHz).
δ_v	Centrifugal distortion correction to γ_v (MHz).
λ_e, $\lambda_{(1)}$, $\lambda_{(2)}$	Expansion coefficients of λ in a power series of ξ.
γ_e, $\gamma_{(1)}$	Expansion coefficients of γ in a power series of ξ.
b, c	Magnetic hyperfine coupling constants:

$$b=-\mu_Bg_n\mu_n\left\langle\frac{3\cos^2\chi-1}{r^3}\right\rangle+\frac{16}{3}\pi\mu_Bg_n\mu_n|\psi(0)|^2,$$

$$c=3\mu_Bg_n\mu_n\left\langle\frac{3\cos^2\chi-1}{r^3}\right\rangle,$$

where μ_B is the Bohr magneton, μ_n the nuclear magneton and g_n the nuclear g-valve.

1.4. $^2\Pi$-Ground State Molecules

As in the case of the $^3\Sigma$-molecules, the energy levels of a $^2\Pi$-molecule exhibit the additional splittings due to the electron spin and orbital angular momentum interactions. In order to describe the rotational spectra of this class, Hund's coupling case (a) is employed as a starting point. The rotational levels are defined with the quantum number Ω, the absolute value of the projection of the total electronic angular momentum on the molecular axis, with the quantum number J which represents the total angular momentum from rotation and electronic motion, and with the parity. For NO the parity, + or −, of the levels split by Ω-doubling follows the notation of ref. [12]. Although the parity is not known for the other $^2\Pi$ diatomic molecules, it is necessary to distinguish transitions of $+\leftarrow-$ and $-\leftarrow+$. Here the notation a and b is used, where a refers to transitions between the higher energy Λ-doubled levels and b to the lower energy levels. If the molecule contains nuclei with non-zero spin, the coupling of J with I results in the total angular momentum quantum number, F, assuming coupling case (a_β). The spectral line table for NO uses the headings F_+ and F_- to indicate the Kronig symmetry and the total angular momentum quantum number.

The electric dipole transitions are given by the following selection rules: $\Delta\Omega=0$, $\Delta J=0,\pm1$, and $+\leftrightarrow-$ plus the normal selection rule for hyperfine splittings, $\Delta F=0,\pm1$.

a. Molecular Parameters and Energy Level Formulation

The rotational energies, derived from the observed rotational transitions, can be described with the Hamiltonian [12]:

$$\mathcal{H}=B(\mathbf{J}^2-L_z^2+\mathbf{S}^2)+AL_zS_z-2B\mathbf{J}\cdot\mathbf{S}$$
$$+(B+A/2)(L_+S_-+L_-S_+)-B(J_+L_-+J_-L_+)+\gamma(\mathbf{J}-\mathbf{S})\cdot\mathbf{S}$$

where a molecule-fixed cartesian coordinate system, with the z-axis along the molecular axis, is employed. The operators, L_z, L_+ and L_-, are the three spherical components of the electronic orbital angular momentum; S_z, S_+, and S_- are the equivalent operators for electron spin and J_z, J_+, and J_- for the total angular momentum. The parameters B, A, and γ are functions of the internuclear distance and, thus, may be defined in terms of a power series in $\zeta = \frac{r - r_e}{r_e}$ as:

$$B = B_e(1 - 2\zeta + 3\zeta^3 + \ldots),$$

$$A = A_e + A_{(1)}\zeta + A_{(2)}\zeta^2 + \ldots,$$

$$\gamma = \gamma_e + \gamma_{(1)}\zeta + \ldots$$

The eigenvalue solution of the Hamiltonian above is normally achieved by a perturbation method which takes into account the mixing of various vibrational states, and the mixing of various electronic states with the ground state. In this way centrifugal distortion terms, the vibrational dependence of the molecular parameters, l-uncoupling and Λ- or Ω-doubling can be determined.

There are a variety of possible approximations employed to describe the observed microwave spectra. The method used depends on how close the angular momenta coupling in a specific molecule corresponds to Hund's coupling case (a). Formulations employed for intermediate coupling cases, like that for OH and NO, are given in ref. [13] and [14]. The determinable parameters are B_{v1} and B_{v2}, the effective rotational constants for the $^2\Pi_{1/2}$ and $^2\Pi_{3/2}$, respectively, the centrifugal distortion parameters D_{v1} and D_{v2} and the Λ-doubling parameters α_p and β_p. A very detailed analysis of the Λ-doubling alone is given in ref. [12] while ref. [15] introduces an additional centrifugal term, δ, for the electronic distribution.

The appropriate formulation for coupling cases close to Hund's case (a), e.g. ClO and NS, are given in ref. [16]. The determinable parameters are B_{v1}, B_{v2}, D_{v1}, D_{v2}, where $D_{v1} \equiv D_{v2}$ is assumed in all cases, and the Λ-doubling constant p_{eff} for the $^2\Pi_{1/2}$ state. Here p_{eff} is a function of α_p and β_p.

The rotational constant B_v can be evaluated from B_{v1} and B_{v2} if additional assumptions are made. In a similar manner it is possible to estimate A and $A_{(1)}$ in a few instances.

The hyperfine coupling Hamiltonian given in ref. [10] is evaluated in ref. [14] to first order for the magnetic and nuclear electric quadrupole interactions. Although the first order perturbation treatment is adequate for the interpretation of the microwave spectra, the more detailed analysis in ref. [12] is necessary to adequately describe the radiofrequency spectrum of NO. The determinable parameters are the magnetic coupling constants a, b, c, and d, as well as the quadrupole coupling constant, eqQ, which is proportional to the electric field gradient at the nucleus in the direction of the molecular axis, and $e\bar{q}Q$, which is proportional to the field gradient perpendicular to the molecular axis. In molecules with coupling cases close to case (a), the determinable parameters are functions of combinations of the constants a, b, c, and d.

b. List of Symbols

B_{v1}, B_{v2} — Effective rotational constants in the $^2\Pi_{1/2}$ and $^2\Pi_{3/2}$ state, respectively, for the vth vibrational state (MHz).

D_{v1}, D_{v2} — Centrifugal distortion correction constants in the $^2\Pi_{1/2}$ and $^2\Pi_{3/2}$ state, respectively; D_{eff}, if $D_{v1} = D_{v2}$ is assumed. (MHz).

α_p, β_p — Ω-type doubling parameters,

$$\alpha_p = 4\Sigma(-1)^S \frac{\langle\Pi\,|\,(A+2B)L_y\,|\,\Sigma\rangle\langle\Sigma\,|\,BL_y\,|\,\Pi\rangle}{E_\Sigma - E_\Pi}$$

$$\beta_p = \Sigma\,(-1)^S\,\frac{|\langle\Pi\,|\,BL_y\,|\,\Sigma\rangle|^2}{E_\Sigma - E_\Pi}$$

p_{eff} — Λ-type doubling constant in the $^2\Pi_{1/2}$ state (MHz).

a, b, c, d — Magnetic hyperfine coupling constants (MHz) where,

$$a = 2\mu_B g_n \mu_n \langle 1/r^3\rangle$$

$$b = -\mu_B g_n \mu_n \left\langle\frac{3\cos^2\chi - 1}{r^3}\right\rangle + \frac{16}{3}\pi\,\mu_B\, g_n\mu_n\,|\psi(0)|^2$$

$$c = 3\mu_B g_n \mu_n \left\langle\frac{3\cos^2\chi - 1}{r^3}\right\rangle$$

$$d = 3\mu_B g_n \mu_n \left\langle\frac{\sin^2\chi}{r^3}\right\rangle$$

Here μ_B is the Bohr magneton, μ_n is the nuclear magneton, and g_n is the nuclear g-value.

eqQ — Quadrupole coupling constant along the molecular axis, where $q = \left\langle\frac{3\cos^2\chi - 1}{r^3}\right\rangle$ (MHz).

$e\bar{q}Q$ — Quadrupole coupling constant perpendicular to the molecular axis, where $\bar{q} = \left\langle\frac{3\sin^2\chi}{r^3}\right\rangle$ (MHz).

A — Spin-orbit coupling constant defined by the power series, expansion, $A = A_e + A_{(1)}\zeta + A_{(2)}\zeta^2 + \ldots$.

γ — Spin-rotation coupling constant defined by the power series $\gamma = \gamma_e + \gamma_{(1)}\zeta + \ldots$.

1.5. Evaluation of the Spectral Data

The evaluation involved the selection of the best sets of transition frequencies and molecular constants which were consistent with the measured transitions and their uncertainties.

The selection of the most reliable transition frequencies posed few problems since there were relatively few cases where a variety of measurements were reported for the same transition. In cases where this did occur, the selection was based on both the overall consistency of the measurement in question with the other spectral data available, and on the reported uncertainty in the measurements. In nearly all cases the measurements with the smallest reported uncertainties were found to be the most reliable.

The determination of the most reliable molecular constants posed more severe difficulties. Inconsistencies arose in cases where data were reported by several independent workers who studied quite different regions of the spectrum, e.g. molecular beam measurements vs microwave measurements or centimeter vs millimeter wave measurements. Since all of the available data had not been analyzed simultaneously in these instances, a complete reanalysis was carried out to eliminate the discrepancies. A second source of difficulty involved the number of parameters determinable from the spectral data available. Many recalculations were carried out to determine the minimum set of molecular constants necessary to fit the observed spectra with the result that in a few cases a set of molecular constants, consisting of fewer parameters than were reported in the original work, was sufficient for the analysis. Such recalculations were performed on all of the Group IV/VI diatomic molecules from CO through PbTe, on most of the Group III/VII molecules, and a number of the heavy alkali halides.

These recalculations allowed the detection of a number of misprints in the literature which had not been detectable by simple inspection of the data set. In addition, several misassignments in quantum numbers were corrected. This was primarily a problem in hyperfine structure assignments on the species AlCl, GaCl, GaBr, GaI, InCl, InBr, and InI where the hyperfine structure was only partially resolved. In these cases accurate calculation of the relative intensities was necessary to determine the spectral assignments.

As a cautionary note, the authors recommend that users of this compilation with a particularly critical application should always refer to the original work referenced here in order to double-check the data of interest. Since it is not feasible to produce a detailed account of the misprints and other errors corrected here, it is also advisable to utilize the equations of sections 1.2., 1.3., and 1.4. in order to verify that an earlier error has been rectified rather than generated here.

1.6. Acknowledgments

Since bibliographic search is quite fundamental to a data compliation, the authors appreciate the co-operation of the many spectroscopists who voluntarily provided reprints and preprints of their work. Dr. Barbara Starck was especially helpful in providing bibliographic and spectral information. The previous efforts of Dr. William H. Kirchhoff in working out the software for the format of the computer data handling considerably eased the data handling task. The authors gratefully acknowledge the assistance of Mrs. Gloria Rotter in the library search, data transcription, and key-punching aspects of the compilation.

1.7. References to the Introduction

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2. Molecular Constant and Spectral Line Tables

As described in section 1.1., the data tables for each molecule consist of a table of derived molecular constants followed by the spectral line table. These are ordered alphabetically by the atomic symbols.

The molecular constants are presented for each isotopic species in the order: rotational constants, hyperfine structure constants, electric and magnetic dipole moments, reduced mass and, when appropriate, additional references which were not utilized in the tabulation.

The spectral line tables were organized first by isotopic species. For each species the transition frequencies are listed by increasing J' and by increasing v for each J'. The hyperfine structure for each rotational transition is ordered by increasing transition frequency. The references to all data can be found in section 4.

AgBr

Silver Bromide

	$^{107}Ag^{79}Br$		$^{109}Ag^{79}Br$		$^{107}Ag^{81}Br$		$^{109}Ag^{81}Br$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	1943.6420(50)	71000	1928.4853(50)[a]	71000	1916.0343(80)	73007	1900.8784(80)	73007
Y_{11} [MHz]	-7.0745(70)	71000	-6.9919(70)[a]	71000	-6.3216(70)[a]	71000	-6.8396(70)[a]	71000
Y_{21} [MHz]	0.00502(45)	1504	0.00494(40)	1504	0.00488(44)	1504	0.00480(43)	1504
Y_{02} [kHz]	-0.53(13)	1504	-0.52(13)	1504	-0.52(13)	1504	-0.51(13)	1504
$eq_0Q(Br)$ [MHz]	297.10(15)	71000	297.10(15)	71000	248.19(13)	b		
$eq_1Q(Br)$ [MHz]	297.65(15)	71000	297.65(15)	71000	248.65(15)	b		
$eq_eQ(Br)$ [MHz]	296.82(20)	71000	296.82(20)	71000	247.96(20)	b		
μ_r [amu]	45.4020879		45.7589192		46.0563304		46.4235612	

[a]Calculated from $^{107}Ag^{79}Br$ of Ref. 71000.

[b]Calculated from ratio $Q(^{79}Br/^{81}Br) = 1.19707$ and Ref. 71000.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{107}Ag^{79}Br$	3 – 2	3/2 – 3/2	0	11580.750	(0.05)	71000
	3 – 2	5/2 – 5/2	0	11602.729	(0.05)	71000
	3 – 2	9/2 – 7/2	0	11637.065	(0.05)	71000
	3 – 2	5/2 – 3/2	0	11655.346	(0.10)	71000
	3 – 2	7/2 – 7/2	0	11711.409	(0.05)	71000
	3 – 2	3/2 – 3/2	1	11538.290	(0.05)	71000
	3 – 2	5/2 – 5/2	1	11560.285	(0.05)	71000
	3 – 2	9/2 – 7/2	1	11594.695	(0.05)	71000
	3 – 2	5/2 – 3/2	1	11612.925	(0.05)	71000
	3 – 2	3/2 – 1/2	1	11613.175	(0.05)	71000
	3 – 2	7/2 – 7/2	1	11669.165	(0.05)	71000
	6 – 5	15/2 – 13/2	0	23279.74	(0.10)	1504
	6 – 5	11/2 – 9/2	0	23283.31	(0.10)	1504
	6 – 5	15/2 – 13/2	1	23194.93	(0.10)	1504
	6 – 5	11/2 – 9/2	1	23198.41	(0.10)	1504
	6 – 5	15/2 – 13/2	2	23110.25	(0.10)	1504
	6 – 5	11/2 – 9/2	2	23113.97	(0.10)	1504
	6 – 5	15/2 – 13/2	3	23025.72	(0.10)	1504
	6 – 5	11/2 – 9/2	3	23029.21	(0.10)	1504
	8 – 7		0	31041.52	(2.00)	1504
	8 – 7		1	30927.51	(2.00)	1504
	8 – 7		2	30815.32	(2.00)	1504
$^{109}Ag^{79}Br$	3 – 2	3/2 – 3/2	0	11490.130	(0.05)	71000
	3 – 2	5/2 – 5/2	0	11512.090	(0.05)	71000
	3 – 2	9/2 – 7/2	0	11546.415	(0.05)	71000
	3 – 2	5/2 – 3/2	0	11564.669	(0.10)	71000
	3 – 2	7/2 – 7/2	0	11620.710	(0.05)	71000
	3 – 2	3/2 – 3/2	1	11448.080	(0.05)	71000
	3 – 2	5/2 – 5/2	1	11470.095	(0.05)	71000
	3 – 2	9/2 – 7/2	1	11504.505	(0.05)	71000
	3 – 2	5/2 – 3/2	1	11522.715	(0.10)	71000
	3 – 2	7/2 – 7/2	1	11578.970	(0.05)	71000
	6 – 5	15/2 – 13/2	0	23098.36	(0.10)	1504
	6 – 5	11/2 – 9/2	0	23101.86	(0.10)	1504
	6 – 5	15/2 – 13/2	1	23014.59	(0.10)	1504
	6 – 5	11/2 – 9/2	1	23018.09	(0.10)	1504
	6 – 5	15/2 – 13/2	2	22930.73	(0.10)	1504
	6 – 5	11/2 – 9/2	2	22934.48	(0.10)	1504
	6 – 5	15/2 – 13/2	3	22847.28	(0.10)	1504
	6 – 5	11/2 – 9/2	3	22850.79	(0.10)	1504
	8 – 7		0	30799.52	(2.00)	1504
	8 – 7		1	30687.51	(2.00)	1504
	8 – 7		2	30575.73	(2.00)	1504
$^{107}Ag^{81}Br$	3 – 2	9/2 – 7/2	0	11472.505	(0.05)	73007
	3 – 2	5/2 – 3/2	0	11487.715	(0.10)	73007
	6 – 5	15/2 – 13/2	0	22949.60	(0.10)	1504
	6 – 5	11/2 – 9/2	0	22952.52	(0.10)	1504
	6 – 5	15/2 – 13/2	1	22866.58	(0.10)	1504
	6 – 5	11/2 – 9/2	1	22869.54	(0.10)	1504
	6 – 5	15/2 – 13/2	2	22783.56	(0.10)	1504
	6 – 5	11/2 – 9/2	2	22786.50	(0.10)	1504
	6 – 5	15/2 – 13/2	3	22700.91	(0.10)	1504
	6 – 5	11/2 – 9/2	3	22703.86	(0.10)	1504
	6 – 5	15/2 – 13/2	4	22618.33	(0.20)	1504
	6 – 5	11/2 – 9/2	4	22621.12	(0.20)	1504
	6 – 5	15/2 – 13/2	5	22535.78	(0.50)	1504
	6 – 5	11/2 – 9/2	5	22538.56	(0.50)	1504
	8 – 7		0	30600.77	(2.00)	1504
	8 – 7		1	30489.44	(2.00)	1504
	8 – 7		2	30379.50	(2.00)	1504
$^{109}Ag^{81}Br$	3 – 2	9/2 – 7/2	0	11381.773	(0.05)	73007
	6 – 5	15/2 – 13/2	0	22767.96	(0.10)	1504
	6 – 5	11/2 – 9/2	0	22771.01	(0.10)	1504
	6 – 5	15/2 – 13/2	1	22686.11	(0.10)	1504
	6 – 5	11/2 – 9/2	1	22689.02	(0.10)	1504
	6 – 5	15/2 – 13/2	2	22604.37	(0.10)	1504
	6 – 5	11/2 – 9/2	2	22607.18	(0.10)	1504
	8 – 7		0	30358.80	(2.00)	1504
	8 – 7		1	30249.17	(2.00)	1504
	8 – 7		2	30140.13	(2.00)	1504

AgCl

Silver Chloride

	$^{107}Ag^{35}Cl$	$^{109}Ag^{35}Cl$	$^{107}Ag^{37}Cl$	$^{109}Ag^{37}Cl$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	3686.9638(5)	3670.2772(5)	3536.8750(5)	3520.1882(5)	a
Y_{11} [MHz]	-17.8496(5)	-17.7286(5)	-16.7711(5)	-16.6523(5)	a
Y_{21} [MHz]	0.01871(5)	0.01854(5)	0.01722(5)	0.01706(5)	a
Y_{02} [kHz]	-1.89046(30)	-1.87339(30)	-1.73972(30)	-1.72330(30)	a
Y_{12} [Hz]	-0.53(10)	-0.52(10)	-0.48(10)	-0.47(10)	a
Y_{03} [Hz]	-0.00025	-0.00025	-0.00022	-0.00022	a
$eq_0Q(Cl)$ [MHz]	-36.50(10)	-36.50(10)	-28.77(10)[b]		71000
$eq_1Q(Cl)$ [MHz]	-36.50(10)	-36.50(10)	-28.77(10)[b]		71000
μ_0 [D]	5.70(15)				1503
μ_r [amu]	26.3497888	26.4695880	27.4679636	27.5981658	

[a] Recalculation of the data from Ref. 1534.

[b] Calculated from $Q(^{35}Cl)/Q(^{37}Cl)$ = 1.2688773(15) and eqQ value from Ref. 71000.

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{107}Ag^{35}Cl$	1 – 0	3/2 – 3/2	0	7348.795	(0.05)	71000
	1 – 0	5/2 – 3/2	0	7357.918	(0.05)	71000
	1 – 0	1/2 – 3/2	0	7365.233	(0.05)	71000
	1 – 0	3/2 – 3/2	1	7313.158	(0.05)	71000
	1 – 0	5/2 – 3/2	1	7322.295	(0.05)	71000
	1 – 0	1/2 – 3/2	1	7329.567	(0.05)	71000
	2 – 1	7/2 – 5/2	0	14712.890	(0.05)	71000
	2 – 1	3/2 – 3/2	0	14719.399	(0.05)	71000
	3 – 2	7/2 – 7/2	0	22059.28	(0.20)	1503
	3 – 2	5/2 – 3/2	0	22066.08	(0.20)	1503
	3 – 2	9/2 – 7/2	0	22068.39	(0.20)	1503
	3 – 2	5/2 – 5/2	0	22072.70	(0.20)	1503
	3 – 2		1	21961.54	(1.00)	1503
	4 – 3		0	29424.22	(1.00)	1503
	4 – 3		1	29281.61	(1.00)	1503
	4 – 3		2	29139.00	(1.00)	1503
	4 – 3		3	28997.87	(1.00)	1503
	4 – 3		4	28856.21	(1.00)	1503
	4 – 3		5	28714.58	(1.00)	1503
	15 – 14		0	110315.79	(0.10)	1534
	15 – 14		1	109781.45	(0.10)	1534
	15 – 14		2	109248.16	(0.10)	1534
	15 – 14		3	108716.04	(0.10)	1534
	20 – 19		0	147061.26	(0.10)	1534
	20 – 19		1	146348.79	(0.10)	1534
	20 – 19		2	145637.71	(0.10)	1534
	20 – 19		3	144928.29	(0.10)	1534
	23 – 22		0	169097.96	(0.10)	1534
	23 – 22		1	168278.58	(0.10)	1534
	23 – 22		2	167460.89	(0.10)	1534
	23 – 22		3	166645.01	(0.10)	1534

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{107}Ag^{35}Cl$	24 − 23		0	176441.53	(0.10)	1534
	24 − 23		1	175586.52	(0.10)	1534
	24 − 23		2	174733.32	(0.10)	1534
	24 − 23		3	173881.92	(0.10)	1534
	24 − 23		4	173032.33	(0.10)	1534
	25 − 24		0	183783.97	(0.10)	1534
	25 − 24		1	182893.42	(0.10)	1534
	25 − 24		2	182004.61	(0.10)	1534
	25 − 24		3	181117.74	(0.10)	1534
	25 − 24		4	180232.72	(0.10)	1534
	28 − 27		0	205804.43	(0.10)	1534
	28 − 27		1	204806.89	(0.10)	1534
	28 − 27		2	203811.47	(0.10)	1534
	28 − 27		3	202818.20	(0.10)	1534
	29 − 28		0	213142.04	(0.10)	1534
	29 − 28		1	212108.91	(0.10)	1534
	29 − 28		2	211077.92	(0.10)	1534
	29 − 28		3	210049.15	(0.10)	1534
	29 − 28		4	209022.53	(0.10)	1534
	30 − 29		0	220478.36	(0.10)	1534
	30 − 29		1	219409.65	(0.10)	1534
	30 − 29		2	218343.11	(0.10)	1534
	30 − 29		3	217278.81	(0.10)	1534
	30 − 29		4	216216.80	(0.10)	1534
	33 − 32		0	242479.03	(0.10)	1534
	33 − 32		1	241303.36	(0.10)	1534
	33 − 32		2	240130.11	(0.10)	1534
	33 − 32		3	238959.48	(0.10)	1534
	34 − 33		0	249809.72	(0.10)	1534
	34 − 33		1	248598.35	(0.10)	1534
	34 − 33		2	247389.65	(0.10)	1534
	34 − 33		3	246183.36	(0.10)	1534
	34 − 33		4	244979.79	(0.10)	1534
	35 − 34		0	257138.71	(0.10)	1534
	35 − 34		1	255891.74	(0.10)	1534
	35 − 34		2	254647.51	(0.10)	1534
	35 − 34		3	253405.78	(0.10)	1534
	35 − 34		4	252166.80	(0.10)	1534
	40 − 39		0	293759.30	(0.10)	1534
	45 − 44		0	330334.49	(0.10)	1534
	45 − 44		1	328731.15	(0.10)	1534
	50 − 49		0	366858.51	(0.10)	1534
$^{109}Ag^{35}Cl$	1 − 0	3/2 − 3/2	0	7315.558	(0.05)	71000
	1 − 0	5/2 − 3/2	0	7327.670	(0.05)	71000
	1 − 0	1/2 − 3/2	0	7331.945	(0.05)	71000
	1 − 0	3/2 − 3/2	1	7280.118	(0.05)	71000
	1 − 0	5/2 − 3/2	1	7289.289	(0.05)	71000
	1 − 0	1/2 − 3/2	1	7296.576	(0.05)	71000
	2 − 1	7/2 − 5/2	0	14646.399	(0.05)	71000
	2 − 1	3/2 − 3/2	0	14652.929	(0.05)	71000
	3 − 2		0	21968.64	(1.00)	1503
	3 − 2		2	21755.81	(1.00)	1503
	4 − 3		0	29290.86	(1.00)	1503
	4 − 3		1	29149.44	(1.00)	1503
	4 − 3		2	29008.65	(1.00)	1503
	4 − 3		3	28867.36	(1.00)	1503
	4 − 3		4	28726.62	(1.00)	1503
	15 − 14		0	109817.19	(0.10)	1534
	15 − 14		1	109286.47	(0.10)	1534
	15 − 14		2	108756.87	(0.10)	1534
	15 − 14		3	108228.30	(0.10)	1534
	20 − 19		0	146396.80	(0.10)	1534
	20 − 19		3	144278.20	(0.10)	1534
	20 − 19		1	145689.08	(0.10)	1534
	20 − 19		2	144982.95	(0.10)	1534
	23 − 22		0	168334.02	(0.10)	1534
	23 − 22		1	167520.18	(0.10)	1534
	23 − 22		2	166708.06	(0.10)	1534
	23 − 22		3	165897.70	(0.10)	1534
	24 − 23		0	175644.44	(0.10)	1534
	24 − 23		1	174795.21	(0.10)	1534
	24 − 23		2	173947.77	(0.10)	1534
	24 − 23		3	173102.12	(0.10)	1534
	24 − 23		4	172258.28	(0.10)	1534
	25 − 24		0	182953.76	(0.10)	1534
	25 − 24		1	182069.22	(0.10)	1534
	25 − 24		2	181186.46	(0.10)	1534
	25 − 24		3	180305.56	(0.10)	1534
	25 − 24		4	179426.56	(0.10)	1534
	28 − 27		0	204874.81	(0.10)	1534
	28 − 27		1	203884.07	(0.10)	1534
	28 − 27		2	202895.42	(0.10)	1534
	28 − 27		3	201908.87	(0.10)	1534

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{109}Ag^{35}Cl$	29 – 28		0	212179.42	(0.10)	1534
	29 – 28		1	211153.27	(0.10)	1534
	29 – 28		2	210129.26	(0.10)	1534
	29 – 28		3	209107.39	(0.10)	1534
	29 – 28		4	208087.75	(0.10)	1534
	30 – 29		0	219482.66	(0.10)	1534
	30 – 29		1	218421.16	(0.10)	1534
	30 – 29		2	217361.82	(0.10)	1534
	30 – 29		3	216304.73	(0.10)	1534
	30 – 29		4	215249.96	(0.10)	1534
	33 – 32		0	241384.12	(0.10)	1534
	33 – 32		1	240216.45	(0.10)	1534
	33 – 32		2	239051.24	(0.10)	1534
	33 – 32		3	237888.44	(0.10)	1534
	34 – 33		0	248681.74	(0.10)	1534
	34 – 33		1	247478.67	(0.10)	1534
	34 – 33		2	246278.06	(0.10)	1534
	34 – 33		3	245080.04	(0.10)	1534
	34 – 33		4	243884.56	(0.10)	1534
	35 – 34		0	255977.83	(0.10)	1534
	35 – 34		1	254739.38	(0.10)	1534
	35 – 34		2	253503.45	(0.10)	1534
	35 – 34		3	252270.19	(0.10)	1534
	35 – 34		4	251039.52	(0.10)	1534
	40 – 39		0	292433.57	(0.10)	1534
	50 – 49		0	365204.52	(0.10)	1534
$^{107}Ag^{37}Cl$	3 – 2		0	21170.55	(1.00)	1503
	4 – 3		0	28227.45	(1.00)	1503
	15 – 14		0	105831.31	(0.10)	1534
	15 – 14		1	105329.18	(0.10)	1534
	15 – 14		2	104828.15	(0.10)	1534
	20 – 19		0	141084.05	(0.10)	1534
	20 – 19		1	140414.55	(0.10)	1534
	20 – 19		2	139746.53	(0.10)	1534
	24 – 23		0	169271.48	(0.10)	1534
	24 – 23		1	168468.11	(0.10)	1534
	24 – 23		2	167666.40	(0.10)	1534
	25 – 24		0	176315.96	(0.10)	1534
	25 – 24		1	175479.13	(0.10)	1534
	25 – 24		2	174643.94	(0.10)	1534
	25 – 24		3	173810.56	(0.10)	1534
	26 – 25		0	183359.37	(0.10)	1534
	26 – 25		1	182489.02	(0.10)	1534
	26 – 25		2	181620.52	(0.10)	1534
	29 – 28		0	204482.84	(0.10)	1534
	29 – 28		1	203512.10	(0.10)	1534
	29 – 28		2	202543.39	(0.10)	1534
	30 – 29		0	211521.68	(0.10)	1534
	30 – 29		1	210517.47	(0.10)	1534
	30 – 29		2	209515.31	(0.10)	1534
	30 – 29		3	208515.20	(0.10)	1534
	31 – 30		0	218559.22	(0.10)	1534
	31 – 30		1	217521.55	(0.10)	1534
	31 – 30		2	216485.99	(0.10)	1534
	31 – 30		3	215452.51	(0.10)	1534
	34 – 33		0	239664.03	(0.10)	1534
	34 – 33		1	238525.88	(0.10)	1534
	34 – 33		2	237390.12	(0.10)	1534
	35 – 34		0	246696.13	(0.10)	1534
	35 – 34		1	245524.49	(0.10)	1534
	35 – 34		2	244355.34	(0.10)	1534
	35 – 34		3	243188.50	(0.10)	1534
	36 – 35		0	253726.76	(0.10)	1534
	36 – 35		1	252521.72	(0.10)	1534
	36 – 35		2	251319.05	(0.10)	1534
	40 – 39		0	281833.92	(0.10)	1534
$^{109}Ag^{37}Cl$	3 – 2		0	21070.41	(1.00)	1503
	4 – 3		0	28094.08	(1.00)	1503
	4 – 3		1	27960.86	(1.00)	1503
	4 – 3		2	27828.84	(1.00)	1503
	15 – 14		0	105332.67	(0.10)	1534
	15 – 14		1	104834.10	(0.10)	1534
	15 – 14		2	104336.62	(0.10)	1534
	20 – 19		0	140419.39	(0.10)	1534
	20 – 19		1	139754.73	(0.10)	1534
	20 – 19		2	139091.40	(0.10)	1534
	24 – 23		0	168474.24	(0.10)	1534
	24 – 23		1	167676.58	(0.10)	1534
	24 – 23		2	166880.56	(0.10)	1534
	25 – 24		0	175485.62	(0.10)	1534
	25 – 24		1	174654.61	(0.10)	1534
	25 – 24		2	173825.37	(0.10)	1534
	25 – 24		3	172997.93	(0.10)	1534
	26 – 25		0	182495.87	(0.10)	1534

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{109}Ag^{37}Cl$	26 – 25		1	181631.72	(0.10)	1534
	26 – 25		2	180769.34	(0.10)	1534
	29 – 28		0	203520.08	(0.10)	1534
	29 – 28		1	202556.19	(0.10)	1534
	29 – 28		2	201594.29	(0.10)	1534
	30 – 29		0	210525.86	(0.10)	1534
	30 – 29		1	209528.71	(0.10)	1534
	30 – 29		2	208533.58	(0.10)	1534
	30 – 29		3	207540.58	(0.10)	1534
	31 – 30		0	217530.34	(0.10)	1534
	31 – 30		1	216499.93	(0.10)	1534
	31 – 30		2	215471.69	(0.10)	1534
	31 – 30		3	214445.51	(0.10)	1534
	34 – 33		0	238535.95	(0.10)	1534
	34 – 33		1	237405.74	(0.10)	1534
	34 – 33		2	236277.97	(0.10)	1534
	35 – 34		0	245534.95	(0.10)	1534
	35 – 34		1	244371.66	(0.10)	1534
	35 – 34		2	243210.76	(0.10)	1534
	35 – 34		3	242052.15	(0.10)	1534
	36 – 35		0	252532.67	(0.10)	1534
	36 – 35		1	251336.02	(0.10)	1534
	36 – 35		2	250141.95	(0.10)	1534
	36 – 35		3	248950.23	(0.10)	1534

AgF

Silver Monofluoride

	$^{107}Ag^{19}F$		$^{109}Ag^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	7965.545(9)	70000	7943.475(10)	70000
Y_{11} [MHz]	-57.577(13)	70000	-57.338(13)	70000
Y_{21} [MHz]	0.114(5)	70000	0.113(5)	70000
Y_{02} [kHz]	-8.50(37)	70000	-8.45(37)	70000
μ_0 [D]	6.22(20)	70000		
μ_r [amu]	16.131611		16.176431	

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{107}Ag^{19}F$	2 – 1		0	31746.846	(0.05)	70000
	2 – 1		1	31517.450	(0.05)	70000
	3 – 2		0	47619.806	(0.05)	70000
	3 – 2		1	47275.719	(0.05)	70000
	3 – 2		2	46933.000	(0.10)	70000
$^{109}Ag^{19}F$	2 – 1		0	31659.100	(0.05)	70000
	2 – 1		1	31430.625	(0.05)	70000
	3 – 2		0	47488.076	(0.05)	70000
	3 – 2		1	47145.433	(0.05)	70000
	3 – 2		2	46804.119	(0.10)	70000

AgI

Silver Iodide

		$^{107}Ag^{127}I$		$^{109}Ag^{127}I$	
Constant		Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01}	[MHz]	1345.1105(25)	71000	1331.7050(25)	c
Y_{11}	[MHz]	-4.2389(30)	71000	-4.1755(30)	c
Y_{21}	[MHz]	0.0017(8)	71000	0.0017(8)	c
Y_{02}	[kHz]	-0.2540(2)[a]	71000	-0.2490(2)	c
eq_0Q (I)	[MHz]	-1062.262(100)	b	-1062.262(100)	c
eq_1Q (I)	[MHz]	-1064.735(100)	b	-1064.735(100)	c
eq_eQ (I)	[MHz]	-1061.026(150)	b		
μ_r	[amu]	58.0247191		58.6088194	

[a]Calculated from $Y_{02} = -4B_e^3/\omega_e^2$ where $Y_{01} \approx B_e$ and $\omega_e = 206.52\ cm^{-1}$.

[b]Recalculation from the data of Ref. 71000 including higher order effects up to J = 8.

[c]Calculated from $^{107}Ag^{127}I$ of Ref. 71000.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{107}Ag^{127}I$	4 – 3	11/2 – 11/2	0	10563.680	(0.05)	71000
	4 – 3	5/2 – 3/2	0	10703.190	(0.05)	71000
	4 – 3	7/2 – 5/2	0	10710.709	(0.05)	71000
	4 – 3	9/2 – 7/2	0	10734.706	(0.05)	71000
	4 – 3	13/2 – 11/2	0	10752.165	(0.05)	71000
	4 – 3	11/2 – 9/2	0	10758.565	(0.05)	71000
	4 – 3	7/2 – 7/2	0	10809.670	(0.05)	71000
	4 – 3	5/2 – 5/2	0	10826.065	(0.05)	71000
	4 – 3	11/2 – 11/2	1	10529.334	(0.05)	71000
	4 – 3	3/2 – 1/2	1	10687.340	(0.05)	71000
	4 – 3	9/2 – 7/2	1	10700.781	(0.05)	71000
	4 – 3	13/2 – 11/2	1	10718.291	(0.05)	71000
	4 – 3	11/2 – 9/2	1	10724.710	(0.05)	71000
	4 – 3	7/2 – 7/2	1	10775.885	(0.05)	71000
	4 – 3	7/2 – 5/2	2	10642.835	(0.05)	71000
	4 – 3	13/2 – 11/2	2	10684.470	(0.05)	71000
	4 – 3	11/2 – 9/2	2	10690.880	(0.05)	71000
	4 – 3	13/2 – 11/2	3	10650.660	(0.05)	71000
	4 – 3	11/2 – 9/2	3	10657.110	(0.05)	71000
$^{109}Ag^{127}I$	4 – 3	11/2 – 11/2	0	10456.640	(0.05)	71000
	4 – 3	5/2 – 3/2	0	10596.163	(0.05)	71000
	4 – 3	7/2 – 5/2	0	10603.689	(0.05)	71000
	4 – 3	9/2 – 7/2	0	10627.701	(0.05)	71000
	4 – 3	13/2 – 11/2	0	10645.185	(0.05)	71000
	4 – 3	11/2 – 9/2	0	10651.605	(0.05)	71000
	4 – 3	11/2 – 11/2	1	10422.870	(0.05)	71000
	4 – 3	5/2 – 3/2	1	10562.703	(0.05)	71000
	4 – 3	7/2 – 5/2	1	10570.223	(0.05)	71000
	4 – 3	9/2 – 7/2	1	10594.276	(0.05)	71000
	4 – 3	13/2 – 11/2	1	10611.834	(0.05)	71000
	4 – 3	11/2 – 9/2	1	10618.256	(0.05)	71000
	4 – 3	7/2 – 5/2	2	10536.805	(0.05)	71000
	4 – 3	13/2 – 11/2	2	10578.505	(0.05)	71000
	4 – 3	11/2 – 9/2	2	10584.885	(0.05)	71000
	4 – 3	13/2 – 11/2	3	10545.185	(0.05)	71000
	4 – 3	11/2 – 9/2	3	10551.625	(0.05)	71000

AlBr

Aluminum Monobromide

	$^{27}Al^{79}Br$	$^{27}Al^{81}Br$	
Constant	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	4772.6098(10)	4742.5866(10)	72000
Y_{11} [MHz]	-25.7956(7)	-25.5526(7)	72000
Y_{21} [MHz]	0.6087(11)	0.06010(11)	72000
Y_{02} [kHz]	-3.3832(11)	-3.3408(11)	72000
Y_{12} [Hz]	6.2(5)	6.1(5)	72000
Y_{03} [10^{-4}Hz]	-3.354(11)	-3.291(11)	72000
eq_0Q(Al) [MHz]	-27.90(50)		72006[a]
eq_0Q(Br) [MHz]	+78.78(20)		72006[a]
μ_r [amu]	20.1070891	20.2343844	

[a]See [73020].

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{79}Br$	1 – 0	3 , 1/2 – 4 , 3/2	0	9498.894	(0.05)	72006
	1 – 0	2 , 1/2 – 2 , 3/2	0	9499.319	(0.05)	72006
	1 – 0	4 , 5/2 – 3 , 3/2	0	9513.165	(0.05)	72006
	1 – 0	3 , 5/2 – 2 , 3/2	0	9514.690	(0.05)	72006
	1 – 0	2 , 5/2 – 1 , 3/2	0	9515.790	(0.05)	72006
	1 – 0	5 , 5/2 – 4 , 3/2	0	9516.921	(0.05)	72006
	1 – 0	4 , 3/2 – 4 , 3/2	0	9534.497	(0.05)	72006
	1 – 0	3 , 3/2 – 2 , 3/2	0	9537.718	(0.05)	72006
	5 – 4		0	47595.68	(0.30)	73000
	5 – 4		1	47339.00	(0.50)	73000
	5 – 4		2	47083.64	(0.50)	73000
	6 – 5		0	57113.90	(0.30)	73000
	6 – 5		1	56805.80	(0.50)	73000
	9 – 8		0	85665.19	(0.10)	72000
	9 – 8		1	85203.12	(0.10)	72000
	10 – 9		0	95181.05	(0.10)	72000
	10 – 9		1	94667.55	(0.10)	72000
	10 – 9		2	94156.57	(0.10)	72000
	11 – 10		0	104695.98	(0.10)	72000
	11 – 10		1	104131.24	(0.10)	72000
	11 – 10		2	103569.10	(0.10)	72000
	11 – 10		3	103009.66	(0.10)	72000
	12 – 11		0	114210.05	(0.10)	72000
	12 – 11		1	113593.97	(0.10)	72000
	12 – 11		2	112980.75	(0.10)	72000
	12 – 11		3	112370.52	(0.10)	72000
	13 – 12		0	123723.19	(0.10)	72000
	13 – 12		1	123055.74	(0.10)	72000
	13 – 12		2	122391.48	(0.10)	72000
	13 – 12		3	121730.28	(0.10)	72000
	14 – 13		0	133235.23	(0.10)	72000
	14 – 13		1	132516.55	(0.10)	72000
	14 – 13		2	131801.08	(0.10)	72000
	14 – 13		3	131089.10	(0.10)	72000
	15 – 14		0	142746.19	(0.10)	72000
	15 – 14		1	141976.05	(0.10)	72000
	15 – 14		2	141209.53	(0.10)	72000

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{79}Br$	15 – 14		3	140446.78	(0.10)	72000
	16 – 15		0	152255.91	(0.10)	72000
	16 – 15		1	151434.36	(0.10)	72000
	16 – 15		2	150616.90	(0.10)	72000
	16 – 15		3	149803.19	(0.10)	72000
	16 – 15		4	148993.43	(0.10)	72000
	17 – 16		0	161764.32	(0.10)	72000
	17 – 16		1	160891.46	(0.10)	72000
	17 – 16		2	160022.82	(0.10)	72000
	17 – 16		3	159158.35	(0.10)	72000
	17 – 16		4	158297.90	(0.10)	72000
	18 – 17		0	171271.36	(0.10)	72000
	18 – 17		1	170347.22	(0.10)	72000
	18 – 17		2	169427.52	(0.10)	72000
	18 – 17		3	168512.15	(0.10)	72000
	18 – 17		4	167601.21	(0.10)	72000
	19 – 18		0	180776.91	(0.10)	72000
	19 – 18		1	179801.44	(0.10)	72000
	19 – 18		2	178830.69	(0.10)	72000
	19 – 18		3	177864.46	(0.10)	72000
	19 – 18		4	176902.93	(0.10)	72000
	19 – 18		5	175945.92	(0.10)	72000
	20 – 19		0	190280.89	(0.10)	72000
	20 – 19		1	189254.12	(0.10)	72000
	20 – 19		2	188232.32	(0.10)	72000
	20 – 19		3	187215.25	(0.10)	72000
	21 – 20		0	199783.40	(0.10)	72000
	21 – 20		1	198705.28	(0.10)	72000
	21 – 20		2	197632.25	(0.10)	72000
	21 – 20		3	196564.32	(0.10)	72000
	22 – 21		0	209284.02	(0.10)	72000
	22 – 21		1	208154.63	(0.10)	72000
	22 – 21		2	207030.59	(0.10)	72000
	22 – 21		3	205911.86	(0.10)	72000
	23 – 22		0	218782.96	(0.10)	72000
	23 – 22		1	217602.26	(0.10)	72000
	23 – 22		2	216427.13	(0.10)	72000
	23 – 22		3	215257.71	(0.10)	72000
	23 – 22		4	214093.74	(0.10)	72000
	24 – 23		0	228280.09	(0.10)	72000
	24 – 23		1	227047.94	(0.10)	72000
	24 – 23		2	225821.85	(0.10)	72000
	24 – 23		3	224601.52	(0.10)	72000
	25 – 24		0	237775.06	(0.10)	72000
	26 – 25		0	247268.15	(0.10)	72000
	26 – 25		1	245933.55	(0.10)	72000
	27 – 26		0	256759.15	(0.10)	72000
	27 – 26		1	255373.24	(0.10)	72000
	27 – 26		2	253993.87	(0.10)	72000
$^{27}Al^{81}Br$	5 – 4		0	47296.88	(0.30)	73000
	5 – 4		1	47042.96	(0.50)	73000
	6 – 5		0	56755.15	(0.30)	73000
	6 – 5		1	56450.00	(0.50)	73000
	9 – 8		0	85127.08	(0.10)	72000
	9 – 8		1	84669.36	(0.10)	72000
	10 – 9		0	94583.16	(0.10)	72000
	10 – 9		1	94074.55	(0.10)	72000
	10 – 9		2	93568.31	(0.10)	72000
	11 – 10		0	104038.41	(0.10)	72000
	11 – 10		1	103478.91	(0.10)	72000
	11 – 10		2	102922.04	(0.10)	72000
	11 – 10		3	102367.84	(0.10)	72000
	12 – 11		0	113492.80	(0.10)	72000
	12 – 11		1	112882.41	(0.10)	72000
	12 – 11		2	112274.93	(0.10)	72000
	13 – 12		0	122946.04	(0.10)	72000
	13 – 12		1	122284.92	(0.10)	72000
	13 – 12		2	121626.92	(0.10)	72000
	13 – 12		3	120971.91	(0.10)	72000
	14 – 13		0	132398.54	(0.10)	72000
	14 – 13		1	131686.45	(0.10)	72000
	14 – 13		2	130977.75	(0.10)	72000
	14 – 13		3	130272.46	(0.10)	72000
	15 – 14		0	141849.69	(0.10)	72000
	15 – 14		1	141086.78	(0.10)	72000
	15 – 14		2	140327.50	(0.10)	72000
	15 – 14		3	139571.86	(0.10)	72000
	16 – 15		0	151299.75	(0.10)	72000
	16 – 15		1	150485.98	(0.10)	72000
	16 – 15		2	149676.10	(0.10)	72000
	16 – 15		3	148870.04	(0.10)	72000
	16 – 15		4	148067.85	(0.10)	72000
	17 – 16		0	160748.48	(0.10)	72000

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{81}Br$	17 – 16		1	159883.90	(0.10)	72000
	17 – 16		2	159023.39	(0.10)	72000
	17 – 16		3	158166.96	(0.10)	72000
	17 – 16		4	157314.71	(0.10)	72000
	18 – 17		0	170195.88	(0.10)	72000
	18 – 17		1	169280.38	(0.10)	72000
	18 – 17		2	168369.41	(0.10)	72000
	18 – 17		3	167462.53	(0.10)	72000
	18 – 17		4	166560.14	(0.10)	72000
	19 – 18		0	179641.81	(0.10)	72000
	19 – 18		1	178675.54	(0.10)	72000
	19 – 18		2	177713.83	(0.10)	72000
	19 – 18		3	176756.63	(0.10)	72000
	19 – 18		4	175804.06	(0.10)	72000
	19 – 18		5	174856.25	(0.10)	72000
	20 – 19		0	189086.17	(0.10)	72000
	20 – 19		1	188069.03	(0.10)	72000
	20 – 19		2	187056.92	(0.10)	72000
	20 – 19		3	186049.37	(0.10)	72000
	21 – 20		0	198529.07	(0.10)	72000
	21 – 20		1	197461.10	(0.10)	72000
	21 – 20		2	196398.21	(0.10)	72000
	21 – 20		3	195340.43	(0.10)	72000
	22 – 21		0	207970.16	(0.10)	72000
	22 – 21		1	206851.32	(0.10)	72000
	22 – 21		2	205738.06	(0.10)	72000
	22 – 21		3	204629.72	(0.10)	72000
	23 – 22		0	217409.52	(0.10)	72000
	23 – 22		1	216239.85	(0.10)	72000
	23 – 22		2	215075.87	(0.10)	72000
	23 – 22		3	213917.43	(0.10)	72000
	23 – 22		4	212764.25	(0.10)	72000
	24 – 23		0	226846.89	(0.10)	72000
	24 – 23		1	225626.60	(0.10)	72000
	24 – 23		2	224412.01	(0.10)	72000
	24 – 23		3	223203.12	(0.10)	72000
	25 – 24		0	236282.63	(0.10)	72000
	26 – 25		0	245716.21	(0.10)	72000
	26 – 25		1	244394.18	(0.10)	72000
	27 – 26		0	255147.75	(0.10)	72000
	27 – 26		1	253774.88	(0.10)	72000
	27 – 26		2	252408.52	(0.10)	72000

AlCl

Aluminum Monochloride

	$^{27}Al^{35}Cl$		$^{27}Al^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	7312.8411(21)	72000	7140.7832(21)	72000
Y_{11} [MHz]	-48.3005(18)	72000	-46.6058(17)	72000
Y_{21} [MHz]	0.1408(5)	72000	0.1343(5)	72000
Y_{31} [kHz]	-0.17(4)	72000	-0.16(4)	72000
Y_{02} [kHz]	-7.503(4)	72000	-7.154(4)	72000
Y_{12} [kHz]	0.016(2)	72000	0.015(2)	72000
Y_{03} [Hz]	$-1.336(7)x10^{-3}$	72000	$-1.243(7)x10^{-3}$	72000
$eq_0Q(Al)$ [MHz]	-29.8(10)	1344[a]	-29.8(10)	b
$eq_0Q(Cl)$ [MHz]	-8.6(10)	1344[a]	-6.9(15)	c
μ_r [amu]	15.2301459		15.5977366	

[a]Recalculation of Ref. 1344, new assignments in frequency list, see [73020].

[b]Assumed from $^{27}Al^{35}Cl$, Ref. 1344.

[c]Calculated from ratio of $Q(^{35}Cl)/Q(^{37}Cl)$.

Additional Ref. 1655.

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{35}Cl$	2 – 1	2 , 7/2 – 2 , 7/2	0	29148.5	(0.20)	1344
	2 – 1	3 , 3/2 – 3 , 3/2	0	29151.7	(0.20)	1344
	2 – 1	4 , 7/2 – 3 , 5/2	0	29154.1	(0.20)	1344
	2 – 1	3 , 7/2 – 2 , 5/2	0	29155.33	(0.20)	1344
	2 – 1	4 , 7/2 – 4 , 5/2	0	29155.69	(0.20)	1344
	2 – 1	5 , 7/2 – 4 , 5/2	0	29156.18	(0.20)	1344
	2 – 1	3 , 5/2 – 3 , 5/2	0	29156.7	(0.20)	1344
	2 – 1	1 , 5/2 – 1 , 5/2	0	29158.0	(0.20)	1344
	2 – 1	2 , 3/2 – 3 , 5/2	0	29161.5	(0.20)	1344
	2 – 1	3 , 3/2 – 4 , 5/2	0	29162.1	(0.20)	1344
	3 – 2		0	43731.8	(0.20)	1344
	3 – 2		1	43443.7	(0.20)	1344
	6 – 5		0	87458.29	(0.10)	72000
	6 – 5		1	86882.05	(0.01)	72000
	6 – 5		2	86309.23	(0.10)	72000
	6 – 5		3	85739.68	(0.10)	72000
	7 – 6		0	102031.91	(0.10)	72000
	7 – 6		1	101359.64	(0.01)	72000
	7 – 6		2	100691.22	(0.10)	72000
	7 – 6		3	100026.83	(0.10)	72000
	7 – 6		4	99366.46	(0.10)	72000
	8 – 7		0	116604.25	(0.10)	72000
	8 – 7		1	115836.03	(0.01)	72000
	8 – 7		2	115072.20	(0.10)	72000
	8 – 7		3	114312.84	(0.10)	72000
	8 – 7		4	113558.01	(0.10)	72000
	8 – 7		5	112807.54	(0.10)	72000
	9 – 8		0	131175.19	(0.10)	72000
	9 – 8		1	130310.94	(0.01)	72000
	9 – 8		2	129451.59	(0.10)	72000
	9 – 8		3	128597.43	(0.10)	72000
	9 – 8		4	127748.21	(0.10)	72000
	10 – 9		0	145744.52	(0.10)	72000
	10 – 9		1	144784.21	(0.01)	72000
	10 – 9		2	143829.56	(0.10)	72000
	10 – 9		3	142880.42	(0.10)	72000

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{35}Cl$	10 – 9		4	141936.81	(0.10)	72000
	10 – 9		5	140998.74	(0.10)	72000
	10 – 9		6	140066.14	(0.10)	72000
	11 – 10		0	160312.06	(0.10)	72000
	11 – 10		1	159255.64	(0.01)	72000
	11 – 10		2	158205.59	(0.10)	72000
	11 – 10		3	157161.53	(0.10)	72000
	11 – 10		4	156123.56	(0.10)	72000
	11 – 10		5	155091.84	(0.10)	72000
	12 – 11		0	174877.60	(0.10)	72000
	12 – 11		1	173725.27	(0.01)	72000
	12 – 11		2	172579.60	(0.10)	72000
	12 – 11		3	171440.75	(0.10)	72000
	12 – 11		4	170308.49	(0.10)	72000
	12 – 11		5	169182.89	(0.10)	72000
	12 – 11		6	168063.92	(0.10)	72000
	13 – 12		0	189440.99	(0.10)	72000
	13 – 12		1	188192.60	(0.01)	72000
	13 – 12		2	186951.59	(0.10)	72000
	13 – 12		3	185717.80	(0.10)	72000
	13 – 12		4	184491.20	(0.10)	72000
	13 – 12		5	183271.83	(0.10)	72000
	13 – 12		6	182059.62	(0.10)	72000
	13 – 12		7	180854.63	(0.10)	72000
	13 – 12		8	179656.64	(0.10)	72000
	14 – 13		0	204002.08	(0.10)	72000
	14 – 13		1	202657.71	(0.01)	72000
	14 – 13		2	201321.11	(0.10)	72000
	14 – 13		3	199992.46	(0.10)	72000
	14 – 13		4	198671.55	(0.10)	72000
	14 – 13		5	197358.49	(0.10)	72000
	15 – 14		0	218560.59	(0.10)	72000
	15 – 14		1	217120.28	(0.01)	72000
	15 – 14		2	215688.26	(0.10)	72000
	15 – 14		3	214264.67	(0.10)	72000
	15 – 14		4	212849.41	(0.10)	72000
	15 – 14		5	211442.53	(0.10)	72000
	15 – 14		6	210043.83	(0.10)	72000
	16 – 15		0	233116.40	(0.10)	72000
	16 – 15		1	231580.08	(0.10)	72000
	16 – 15		2	230052.56	(0.10)	72000
	17 – 16		0	247669.37	(0.10)	72000
	17 – 16		1	246037.01	(0.10)	72000
	18 – 17		0	262219.39	(0.10)	72000
	19 – 18		0	276765.86	(0.10)	72000
$^{27}Al^{37}Cl$	3 – 2		0	42704.6	(0.20)	1344
	6 – 5		0	85404.01	(0.10)	72000
	6 – 5		1	84848.02	(0.10)	72000
	7 – 6		0	99635.39	(0.10)	72000
	7 – 6		1	98986.67	(0.10)	72000
	7 – 6		2	98341.73	(0.10)	72000
	8 – 7		0	113865.55	(0.10)	72000
	8 – 7		1	113124.26	(0.10)	72000
	8 – 7		2	112387.05	(0.10)	72000
	9 – 8		0	128094.36	(0.10)	72000
	9 – 8		1	127260.37	(0.10)	72000
	10 – 9		0	142321.68	(0.10)	72000
	10 – 9		1	141395.00	(0.10)	72000
	10 – 9		2	140473.65	(0.10)	72000
	10 – 9		3	139557.60	(0.10)	72000
	10 – 9		4	138646.88	(0.10)	72000
	11 – 10		0	156547.24	(0.10)	72000
	11 – 10		1	155527.94	(0.10)	72000
	11 – 10		2	154514.42	(0.10)	72000
	11 – 10		3	153506.82	(0.10)	72000
	12 – 11		0	170770.85	(0.10)	72000
	12 – 11		1	169658.90	(0.10)	72000
	12 – 11		2	168553.32	(0.10)	72000
	12 – 11		3	167454.14	(0.10)	72000
	12 – 11		4	166361.35	(0.10)	72000
	12 – 11		5	165274.87	(0.10)	72000
	13 – 12		0	184992.61	(0.10)	72000
	13 – 12		1	183787.90	(0.10)	72000
	13 – 12		2	182590.16	(0.10)	72000
	13 – 12		3	181399.42	(0.10)	72000
	13 – 12		4	180215.49	(0.10)	72000
	13 – 12		5	179038.54	(0.10)	72000
	14 – 13		0	199211.93	(0.10)	72000
	14 – 13		1	197914.61	(0.10)	72000
	14 – 13		2	196624.89	(0.10)	72000
	14 – 13		3	195342.48	(0.10)	72000
	15 – 14		0	213428.88	(0.10)	72000
	15 – 14		1	212039.04	(0.10)	72000

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{37}Cl$	15 – 14		2	210657.12	(0.10)	72000
	15 – 14		3	209283.17	(0.10)	72000
	16 – 15		0	227643.31	(0.10)	72000
	16 – 15		1	226160.96	(0.10)	72000
	16 – 15		2	224686.83	(0.10)	72000
	17 – 16		0	241855.07	(0.10)	72000
	17 – 16		1	240279.89	(0.10)	72000
	18 – 17		0	256063.78	(0.10)	72000
	18 – 17		1	254396.00	(0.10)	72000

AlF

Aluminum Monofluoride

Constant		$^{27}Al^{19}F$ Value (Unc.)	Ref.
Y_{01}	[MHz]	16562.930(6)	70001
Y_{11}	[MHz]	-149.420(3)	70001
Y_{21}	[MHz]	0.515(4)	70001
Y_{31}	[kHz]	1.4(6)	70001
Y_{02}	[kHz]	-31.37(2)	70001
Y_{12}	[kHz]	0.046(14)	70001
Y_{03}	[Hz]	-0.0110	a
eq_0Q (Al)	[MHz]	-37.53(12)	70002
eq_1Q (Al)	[MHz]	-37.07(12)	70002
eq_eQ (Al)	[MHz]	-37.75(8)	70002
c_1	[kHz]	8(6)	70002
μ_0	[D]	1.53(10)	1344
μ_r	[amu]	11.1484740	

[a]Calculated from data of Ref. 70001.

Additional Ref. 1114 and 1344.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{19}F$	1 – 0	5/2 – 5/2	0	32970.592	(0.03)	70002
	1 – 0	7/2 – 5/2	0	32978.500	(0.02)	70002
	1 – 0	3/2 – 5/2	0	32981.827	(0.04)	70002
	1 – 0	5/2 – 5/2	1	32673.825	(0.05)	70002
	1 – 0	7/2 – 5/2	1	32681.688	(0.03)	70002
	1 – 0	3/2 – 5/2	1	32684.963	(0.05)	70002
	1 – 0	5/2 – 5/2	2	32379.263	(0.07)	70002
	1 – 0	7/2 – 5/2	2	32387.048	(0.05)	70002
	1 – 0	3/2 – 5/2	2	32390.198	(0.07)	70002
	3 – 2	9/2 – 9/2	0	98920.24	(0.10)	70001
	3 – 2	7/2 – 5/2	0	98925.60	(0.10)	70001
	3 – 2	9/2 – 7/2	0	98927.64	(0.20)	70001
	3 – 2	3/2 – 5/2	0	98933.51	(0.10)	70001
	3 – 2	9/2 – 9/2	1	98030.00	(0.10)	70001
	3 – 2	7/2 – 5/2	1	98035.33	(0.10)	70001
	3 – 2	9/2 – 7/2	1	98037.15	(0.20)	70001
	4 – 3	11/2 – 11/2	0	131892.39	(0.10)	70001
	4 – 3	9/2 – 7/2	0	131898.48	(0.10)	70001
	4 – 3	11/2 – 9/2	0	131899.22	(0.10)	70001
	4 – 3	11/2 – 11/2	1	130705.41	(0.10)	70001
	4 – 3	9/2 – 7/2	1	130711.44	(0.10)	70001
	4 – 3	11/2 – 9/2	1	130712.10	(0.20)	70001
	6 – 5		0	197833.15	(0.10)	70001
	6 – 5		1	196052.54	(0.10)	70001
	6 – 5		2	194284.39	(0.10)	70001
	6 – 5		3	192528.97	(0.10)	70001
	7 – 6		0	230793.89	(0.10)	70001
	7 – 6		1	228716.54	(0.10)	70001
	7 – 6		2	226653.84	(0.10)	70001
	7 – 6		3	224605.75	(0.10)	70001
	7 – 6		4	222572.54	(0.10)	70001
	8 – 7		0	263749.35	(0.10)	70001
	8 – 7		1	261375.27	(0.10)	70001
	8 – 7		2	259017.92	(0.10)	70001
	8 – 7		3	256677.28	(0.10)	70001
	8 – 7		4	254353.69	(0.10)	70001
	9 – 8		0	296698.87	(0.10)	70001
	9 – 8		1	294028.10	(0.10)	70001
	9 – 8		2	291376.02	(0.10)	70001
	10 – 9		0	329641.64	(0.10)	70001
	10 – 9		1	326674.01	(0.10)	70001
	10 – 9		2	323727.41	(0.10)	70001
	11 – 10		0	362576.79	(0.10)	70001
	11 – 10		1	359312.50	(0.10)	70001
	11 – 10		2	356071.28	(0.10)	70001
	14 – 13		0	461329.74	(0.10)	70001

AlI

Aluminum Iodide

	$^{27}Al^{127}I$	
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	3528.5528(6)	72000
Y_{11} [MHz]	-16.7460(2)	72000
Y_{21} [MHz]	0.03141(3)	72000
Y_{31} [kHz]	-0.0736(16)	72000
Y_{02} [kHz]	-1.9550(3)	72000
Y_{12} [kHz]	0.00287(7)	72000
Y_{03} [Hz]	$-1.376(2)\times10^{-4}$	72000
$eq_0Q(I)$ [MHz]	-309.567(70)	73005
$eq_1Q(I)$ [MHz]	-313.89(10)	73005
$eq_2Q(I)$ [MHz]	-318.18(10)	73005
$eq_3Q(I)$ [MHz]	-322.51(13)	73005
$eq_eQ(I)$ [MHz]	-307.41(12)	73005
$eq_0Q(Al)$ [MHz]	-25.50(10)	73005
$eq_1Q(Al)$ [MHz]	-25.35(15)	73005
$eq_2Q(Al)$ [MHz]	-25.46(20)	73005
$eq_3Q(Al)$ [MHz]	-25.13(30)	73005
$eq_eQ(Al)$ [MHz]	-25.55(25)	73005
c_I [kHz]	13(5)	73005
μ_r [amu]	22.2507434	

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{127}I$	2 – 1	5 , 5/2 – 4 , 3/2	0	14014.367	(0.05)	73005
	2 – 1	4 , 5/2 – 3 , 3/2	0	14016.451	(0.05)	73005
	2 – 1	6 , 7/2 – 6 , 7/2	0	14026.564	(0.05)	73005
	2 – 1	3 , 7/2 – 3 , 7/2	0	14027.879	(0.05)	73005
	2 – 1	5 , 7/2 – 5 , 7/2	0	14028.276	(0.05)	73005
	2 – 1	4 , 7/2 – 4 , 7/2	0	14029.023	(0.05)	73005
	2 – 1	1 , 3/2 – 2 , 3/2	0	14056.844	(0.05)	73005
	2 – 1	4 , 3/2 – 4 , 3/2	0	14058.013	(0.05)	73005
	2 – 1	2 , 3/2 – 3 , 3/2	0	14060.020	(0.05)	73005
	2 – 1	3 , 3/2 – 4 , 3/2	0	14060.879	(0.05)	73005
	2 – 1	3 , 3/2 – 2 , 3/2	0	14061.451	(0.05)	73005
	2 – 1	5 , 9/2 – 5 , 7/2	0	14086.540	(0.05)	73005
	2 – 1	6 , 9/2 – 5 , 7/2	0	14087.163	(0.05)	73005
	2 – 1	7 , 9/2 – 6 , 7/2	0	14087.959	(0.05)	73005
	2 – 1	3 , 9/2 – 3 , 7/2	0	14089.238	(0.05)	73005
	2 – 1	5 , 7/2 – 4 , 5/2	0	14090.082	(0.05)	73005
	2 – 1	4 , 7/2 – 3 , 5/2	0	14090.589	(0.05)	73005
	2 – 1	3 , 7/2 – 2 , 5/2	0	14092.839	(0.05)	73005
	2 – 1	5 , 7/2 – 5 , 5/2	0	14093.626	(0.05)	73005
	2 – 1	6 , 7/2 – 5 , 5/2	0	14094.452	(0.05)	73005
	2 – 1	2 , 7/2 – 1 , 5/2	0	14095.346	(0.05)	73005
	2 – 1	3 , 1/2 – 4 , 3/2	0	14098.675	(0.05)	73005
	2 – 1	2 , 1/2 – 2 , 3/2	0	14099.294	(0.05)	73005
	2 – 1	3 , 1/2 – 3 , 3/2	0	14099.570	(0.05)	73005
	2 – 1	5 , 5/2 – 4 , 5/2	0	14105.820	(0.05)	73005
	2 – 1	4 , 5/2 – 4 , 5/2	0	14107.078	(0.05)	73005
	2 – 1	3 , 5/2 – 3 , 5/2	0	14107.462	(0.05)	73005
	2 – 1	5 , 5/2 – 5 , 5/2	0	14109.450	(0.05)	73005
	2 – 1	3 , 3/2 – 4 , 5/2	0	14152.329	(0.05)	73005
	2 – 1	4 , 3/2 – 5 , 5/2	0	14153.075	(0.05)	73005
	2 – 1	5 , 5/2 – 4 , 3/2	1	13946.737	(0.05)	73005
	2 – 1	4 , 5/2 – 3 , 3/2	1	13948.811	(0.05)	73005
	2 – 1	6 , 7/2 – 6 , 7/2	1	13959.091	(0.05)	73005
	2 – 1	4 , 7/2 – 4 , 7/2	1	13961.552	(0.05)	73005
	2 – 1	4 , 3/2 – 4 , 3/2	1	13991.002	(0.05)	73005
	2 – 1	2 , 3/2 – 3 , 3/2	1	13992.997	(0.05)	73005
	2 – 1	3 , 3/2 – 2 , 3/2	1	13994.401	(0.05)	73005
	2 – 1	6 , 9/2 – 5 , 7/2	1	14020.510	(0.05)	73005
	2 – 1	7 , 9/2 – 6 , 7/2	1	14021.308	(0.05)	73005
	2 – 1	5 , 7/2 – 4 , 5/2	1	14023.541	(0.05)	73005
	2 – 1	4 , 7/2 – 3 , 5/2	1	14024.025	(0.05)	73005
	2 – 1	3 , 7/2 – 2 , 5/2	1	14026.302	(0.05)	73005
	2 – 1	5 , 7/2 – 5 , 5/2	1	14027.096	(0.05)	73005
	2 – 1	6 , 7/2 – 5 , 5/2	1	14027.879	(0.05)	73005
	2 – 1	3 , 1/2 – 4 , 3/2	1	14032.229	(0.05)	73005
	2 – 1	2 , 1/2 – 2 , 3/2	1	14032.748	(0.05)	73005
	2 – 1	3 , 1/2 – 3 , 3/2	1	14033.102	(0.05)	73005
	2 – 1	5 , 5/2 – 4 , 5/2	1	14039.509	(0.05)	73005
	2 – 1	4 , 5/2 – 4 , 5/2	1	14040.722	(0.05)	73005
	2 – 1	3 , 5/2 – 3 , 5/2	1	14041.101	(0.05)	73005
	2 – 1	5 , 5/2 – 5 , 5/2	1	14043.075	(0.05)	73005
	2 – 1	5 , 5/2 – 4 , 3/2	2	13879.340	(0.05)	73005
	2 – 1	4 , 5/2 – 3 , 3/2	2	13881.435	(0.05)	73005
	2 – 1	6 , 7/2 – 6 , 7/2	2	13891.859	(0.05)	73005
	2 – 1	5 , 7/2 – 5 , 7/2	2	13893.609	(0.05)	73005
	2 – 1	4 , 3/2 – 4 , 3/2	2	13924.206	(0.05)	73005
	2 – 1	6 , 9/2 – 5 , 7/2	2	13954.100	(0.05)	73005
	2 – 1	7 , 9/2 – 6 , 7/2	2	13954.930	(0.05)	73005
	2 – 1	5 , 7/2 – 4 , 5/2	2	13957.213	(0.05)	73005
	2 – 1	4 , 7/2 – 3 , 5/2	2	13957.708	(0.05)	73005
	2 – 1	3 , 7/2 – 2 , 5/2	2	13959.965	(0.05)	73005
	2 – 1	6 , 7/2 – 5 , 5/2	2	13961.552	(0.05)	73005
	2 – 1	3 , 1/2 – 4 , 3/2	2	13965.978	(0.05)	73005
	2 – 1	2 , 1/2 – 2 , 3/2	2	13966.558	(0.05)	73005
	2 – 1	3 , 1/2 – 3 , 3/2	2	13966.915	(0.05)	73005
	2 – 1	4 , 5/2 – 4 , 5/2	2	13974.617	(0.05)	73005
	2 – 1	3 , 5/2 – 3 , 5/2	2	13975.000	(0.05)	73005
	2 – 1	5 , 5/2 – 5 , 5/2	2	13976.967	(0.05)	73005
	2 – 1	6 , 7/2 – 6 , 7/2	3	13824.907	(0.05)	73005
	2 – 1	4 , 3/2 – 4 , 3/2	3	13857.715	(0.05)	73005
	2 – 1	6 , 9/2 – 5 , 7/2	3	13888.000	(0.05)	73005
	2 – 1	7 , 9/2 – 6 , 7/2	3	13888.761	(0.05)	73005
	2 – 1	5 , 7/2 – 4 , 5/2	3	13891.157	(0.05)	73005
	2 – 1	4 , 7/2 – 3 , 5/2	3	13891.629	(0.05)	73005
	2 – 1	6 , 7/2 – 5 , 5/2	3	13895.480	(0.05)	73005
	2 – 1	3 , 1/2 – 4 , 3/2	3	13900.026	(0.05)	73005
	2 – 1	4 , 5/2 – 4 , 5/2	3	13908.867	(0.05)	73005
	2 – 1	5 , 5/2 – 5 , 5/2	3	13911.063	(0.05)	73005
	23 – 22		0	161833.56	(0.10)	72000
	23 – 22		1	161066.27	(0.10)	72000
	23 – 22		2	160301.83	(0.10)	72000
	23 – 22		3	159540.23	(0.10)	72000
	23 – 22		4	158781.44	(0.10)	72000
	23 – 22		5	158025.48	(0.10)	72000

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{127}I$	24 – 23		0	168861.00	(0.10)	72000
	24 – 23		1	168060.32	(0.10)	72000
	24 – 23		2	167262.68	(0.10)	72000
	24 – 23		3	166468.03	(0.10)	72000
	24 – 23		4	165676.23	(0.10)	72000
	24 – 23		5	164887.39	(0.10)	72000
	24 – 23		6	164101.45	(0.10)	72000
	25 – 24		0	175887.29	(0.10)	72000
	25 – 24		1	175053.31	(0.10)	72000
	25 – 24		2	174222.37	(0.10)	72000
	25 – 24		3	173394.58	(0.10)	72000
	25 – 24		4	172569.90	(0.10)	72000
	25 – 24		5	171748.13	(0.10)	72000
	25 – 24		6	170929.56	(0.10)	72000
	25 – 24		7	170113.83	(0.10)	72000
	26 – 25		0	182912.40	(0.10)	72000
	26 – 25		1	182045.10	(0.10)	72000
	26 – 25		2	181180.97	(0.10)	72000
	26 – 25		3	180320.08	(0.10)	72000
	26 – 25		4	179462.35	(0.10)	72000
	26 – 25		5	178607.78	(0.10)	72000
	26 – 25		6	177756.43	(0.10)	72000
	26 – 25		7	176908.17	(0.10)	72000
	27 – 26		0	189936.26	(0.10)	72000
	27 – 26		1	189035.62	(0.10)	72000
	27 – 26		2	188138.30	(0.10)	72000
	27 – 26		3	187244.34	(0.10)	72000
	27 – 26		4	186353.70	(0.10)	72000
	27 – 26		5	185466.29	(0.10)	72000
	27 – 26		6	184582.13	(0.10)	72000
	27 – 26		7	183701.22	(0.10)	72000
	27 – 26		8	182823.61	(0.10)	72000
	27 – 26		9	181949.08	(0.10)	72000
	28 – 27		0	196958.99	(0.10)	72000
	28 – 27		1	196024.95	(0.10)	72000
	28 – 27		2	195094.42	(0.10)	72000
	28 – 27		5	192323.46	(0.10)	72000
	28 – 27		3	194167.33	(0.10)	72000
	28 – 27		4	193243.68	(0.10)	72000
	28 – 27		6	191406.56	(0.10)	72000
	28 – 27		7	190493.08	(0.10)	72000
	28 – 27		8	189582.92	(0.10)	72000
	28 – 27		9	188676.07	(0.10)	72000
	29 – 28		0	203980.29	(0.10)	72000
	29 – 28		1	203012.94	(0.10)	72000
	29 – 28		2	202049.20	(0.10)	72000
	29 – 28		3	201089.01	(0.10)	72000
	29 – 28		4	200132.38	(0.10)	72000
	29 – 28		5	199179.26	(0.10)	72000
	29 – 28		6	198229.71	(0.10)	72000
	29 – 28		7	197283.58	(0.10)	72000
	29 – 28		8	196340.98	(0.10)	72000
	29 – 28		9	195401.77	(0.10)	72000
	29 – 28		0	194465.96	(0.10)	72000
	30 – 29		0	211000.21	(0.10)	72000
	30 – 29		1	209999.52	(0.10)	72000
	30 – 29		2	209002.58	(0.10)	72000
	30 – 29		3	208009.28	(0.10)	72000
	30 – 29		4	207019.76	(0.10)	72000
	30 – 29		5	206033.79	(0.10)	72000
	30 – 29		6	205051.50	(0.10)	72000
	30 – 29		7	204072.83	(0.10)	72000
	30 – 29		8	203097.70	(0.10)	72000
	30 – 29		9	202126.07	(0.10)	72000
	30 – 29		0	201157.96	(0.10)	72000
	30 – 29		1	200193.41	(0.10)	72000
	30 – 29		2	199232.28	(0.10)	72000
	30 – 29		3	198274.73	(0.10)	72000
	30 – 29		4	197320.34	(0.10)	72000
	31 – 30		0	218018.79	(0.10)	72000
	31 – 30		1	216984.80	(0.10)	72000
	31 – 30		2	215954.56	(0.10)	72000
	31 – 30		3	214928.25	(0.10)	72000
	31 – 30		4	213905.76	(0.10)	72000
	31 – 30		5	212886.93	(0.10)	72000
	31 – 30		6	211871.88	(0.10)	72000
	31 – 30		7	210860.69	(0.10)	72000
	31 – 30		8	209853.02	(0.10)	72000
	31 – 30		9	208848.98	(0.10)	72000
	31 – 30		0	207848.63	(0.10)	72000
	32 – 31		0	225035.94	(0.10)	72000
	32 – 31		1	223968.58	(0.10)	72000
	32 – 31		2	222905.14	(0.10)	72000
	32 – 31		3	221845.74	(0.10)	72000

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{27}Al^{127}I$	32 – 31		4	220790.23	(0.10)	72000
	32 – 31		6	218690.85	(0.10)	72000
	32 – 31		7	217646.98	(0.10)	72000
	32 – 31		8	216606.90	(0.10)	72000
	32 – 31		9	215570.58	(0.10)	72000
	33 – 32		0	232051.52	(0.10)	72000
	33 – 32		1	230950.84	(0.10)	72000
	33 – 32		2	229854.26	(0.10)	72000
	33 – 32		3	228761.72	(0.10)	72000
	33 – 32		4	227673.24	(0.10)	72000
	33 – 32		5	226588.80	(0.10)	72000
	33 – 32		6	225508.37	(0.10)	72000
	34 – 33		0	239065.58	(0.10)	72000
	34 – 33		1	237931.58	(0.10)	72000
	34 – 33		2	236801.78	(0.10)	72000
	34 – 33		3	235676.19	(0.10)	72000
	34 – 33		4	234554.77	(0.10)	72000
	34 – 33		5	233437.48	(0.10)	72000
	34 – 33		6	232324.26	(0.10)	72000
	34 – 33		7	231215.19	(0.10)	72000
	34 – 33		8	230110.13	(0.10)	72000
	35 – 34		0	246078.05	(0.10)	72000
	35 – 34		1	244910.72	(0.10)	72000
	35 – 34		2	243747.68	(0.10)	72000
	35 – 34		3	242589.03	(0.10)	72000
	35 – 34		4	241434.68	(0.10)	72000
	35 – 34		5	240284.54	(0.10)	72000
	36 – 35		0	253088.88	(0.10)	72000
	36 – 35		1	251888.21	(0.10)	72000
	36 – 35		2	250692.02	(0.10)	72000
	36 – 35		3	249500.26	(0.10)	72000
	36 – 35		4	248312.91	(0.10)	72000
	36 – 35		5	247129.95	(0.10)	72000
	36 – 35		6	245951.42	(0.10)	72000
	36 – 35		7	244777.12	(0.10)	72000
	37 – 36		0	260098.03	(0.10)	72000
	37 – 36		1	258864.03	(0.10)	72000
	37 – 36		2	257634.64	(0.10)	72000
	37 – 36		3	256409.89	(0.10)	72000
	37 – 36		5	253973.71	(0.10)	72000
	38 – 37		0	267105.41	(0.10)	72000
	38 – 37		1	265838.14	(0.10)	72000
	38 – 37		2	264575.51	(0.10)	72000
	38 – 37		3	263317.63	(0.10)	72000
	38 – 37		4	262064.45	(0.10)	72000
	39 – 38		0	274111.02	(0.10)	72000

BF

Boron Monofluoride

	$^{10}B^{19}F$	$^{11}B^{19}F$	
Constant	Value (Unc.)	Value (Unc.)	Ref.
B_0 [MHz]	48022.63(8)	45185.77(6)	71001
$eq_0Q(B)$ [MHz]	-9.5(8)	-4.5(4)	71001
μ_0 [D]		0.5(2)	71001
μ_r [amu]	6.557086(1)	6.970183(1)	

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{10}B^{19}F$	1 − 0	3 − 3	0	96042.88	(0.10)	71001
	1 − 0	4 − 3	0	96044.78	(0.10)	71001
$^{11}B^{19}F$	1 − 0	3/2 − 3/2	0	90369.80	(0.05)	71001
	1 − 0	5/2 − 3/2	0	90370.95	(0.05)	71001
	1 − 0	1/2 − 3/2	0	90371.78	(0.10)	71001

BaO
Barium Oxide

	$^{138}Ba^{16}O$		$^{137}Ba^{16}O$		$^{136}Ba^{16}O$		$^{135}Ba^{16}O$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	9371.9371(20)	73008	9379.0476(20)	a	9386.2760(20)	a	9393.594(20)	b
Y_{11} [MHz]	-41.7468(20)	73008	-41.7943(20)	a	-41.8426(20)	a	-41.885(20)	b
Y_{21} [MHz]	-0.1256(15)	73008	-0.1258(15)	a	-0.1260(15)	a	-0.129(15)	b
Y_{02} [kHz]	-8.04(10)	73008	-8.05(10)	a	-8.06(10)	a	-8.204	b
eq_0Q(Ba) [MHz]			-16.96(40)	73008			-10.1(25)	70005
μ_0 [D]	7.954(3)	1152						
μ_1 [D]	7.997(3)	1152						
μ_2 [D]	7.039(3)	1152						
μ_3 [D]	8.079(3)	1152						
μ_e [D]	7.933(3)	1152						
μ_r [amu]	14.3325560		14.3216901		14.3106610		14.299511	

[a]Calculated with isotopic relations from isotope $^{138}Ba^{16}O$.

[b]Calculated from isotope relations and data in Ref. 70005.

Additional references: 72003, 1154.

BaO	Barium Oxide $A^1\Sigma$	
	$^{138}Ba^{16}O$	
Constant	Value (Unc.)	Ref.
B_e [MHz]	7744.3(7)	73014
α_e [MHz]	32.08(15)	73014
D_e [kHz]	8.4	a

[a] From A. Lagerqvist, E. Lind and R. F. Barrow, Proc. Phys. Soc. 63A, 1132 (1950).

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{138}Ba^{16}O$ $X^1\Sigma$	1 – 0		0	18702.044	(0.05)	1152
	1 – 0		1	18617.979	(0.05)	1152
	1 – 0		2	18533.515	(0.05)	1152
	1 – 0		3	18448.512	(0.05)	1152
	2 – 1		0	37403.873	(0.01)	73008
	2 – 1		1	37235.876	(0.02)	73008
	2 – 1		2	37066.881	(0.02)	73008
	2 – 1		3	36896.865	(0.04)	73008
	3 – 2		0	56105.307	(0.02)	73008
	3 – 2		1	55853.349	(0.02)	73008
	3 – 2		2	55599.835	(0.03)	73008
	3 – 2		3	55344.861	(0.05)	73008
$^{137}Ba^{16}O$ $X^1\Sigma$	2 – 1	7/2 – 5/2	0	37432.584	(0.03)	73008
	2 – 1	5/2 – 3/2	0	37432.584	(0.03)	73008
	3 – 2	5/2 – 3/2	0	56146.997	(0.03)	73008
	3 – 2	3/2 – 1/2	0	56146.997	(0.03)	73008
	3 – 2	9/2 – 7/2	0	56148.048	(0.02)	73008
	3 – 2	7/2 – 5/2	0	56148.048	(0.02)	73008
$^{136}Ba^{16}O$ $X^1\Sigma$	2 – 1		0	37461.040	(0.04)	73008
$^{135}Ba^{16}O$ $X^1\Sigma$	2 – 1	7/2 – 5/2	0	37490.426	(0.10)	70005
$^{138}Ba^{16}O$ $A^1\Sigma$	2 – 1		1	30760.5	(1.00)	73014
	2 – 1		3	30493.	(2.00)	73014
	2 – 1		7	29927.6	(0.10)	72021
	3 – 2		0	46376.	(2.00)	73014
	3 – 2		1	46142.	(1.00)	73014
	3 – 2		2	45986.	(1.00)	73014
	3 – 2		3	45740.	(1.00)	73014
	3 – 2		4	45551.	(1.00)	73014
	3 – 2		5	45397.3	(1.00)	73014
	3 – 2		7	44891.4	(0.20)	72021
	4 – 3		3	60984.5	(1.50)	72021
	5 – 4		3	76226.8	(1.50)	72021
$^{137}Ba^{16}O$ $A^1\Sigma$	3 – 2		1	46177.7	(1.00)	73014

BrCl

Bromine Monochloride

	$^{79}Br^{35}Cl$	$^{81}Br^{35}Cl$	$^{79}Br^{37}Cl$	$^{81}Br^{37}Cl$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	4570.92(4)	4536.14(4)	4499.84(4)	4365.01(4)	50002
Y_{11} [MHz]	-23.22(3)	-22.95(3)	-21.94(3)	-21.67(3)	50002
$eq_0Q(Br)$ [MHz]	876.8(9)	732.9(5)	876.8(9)	732.9(5)	50002
$eq_0Q(Cl)$ [MHz]	-103.6(2)	-103.6(2)	-81.14(15)	-81.14(15)	50002
μ_0 [D]	0.57(2)				50002
μ_r [amu]	24.2317306	24.4168479	25.1741525	25.3740084	

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{79}Br^{35}Cl$	1 – 0	2 , 1/2 – 3 , 3/2	0	8899.50	(0.20)	50002
	1 – 0	3 , 5/2 – 3 , 3/2	0	9063.77	(0.20)	50002
	1 – 0	2 , 5/2 – 3 , 3/2	0	9074.91	(0.20)	50002
	1 – 0	4 , 5/2 – 3 , 3/2	0	9080.73	(0.20)	50002
	1 – 0	1 , 5/2 – 0 , 3/2	0	9088.61	(0.20)	50002
	1 – 0	3 , 3/2 – 3 , 3/2	0	9291.61	(0.20)	50002
	1 – 0	2 , 3/2 – 3 , 3/2	0	9307.96	(0.20)	50002
	1 – 0	4 , 5/2 – 3 , 3/2	1	9034.14	(0.20)	50002
$^{81}Br^{35}Cl$	1 – 0	2 , 1/2 – 3 , 3/2	0	8865.66	(0.20)	50002
	1 – 0	3 , 5/2 – 3 , 3/2	0	9001.44	(0.20)	50002
	1 – 0	2 , 5/2 – 3 , 3/2	0	9012.97	(0.20)	50002
	1 – 0	4 , 5/2 – 3 , 3/2	0	9018.40	(0.20)	50002
	1 – 0	1 , 5/2 – 0 , 3/2	0	9026.17	(0.20)	50002
	1 – 0	3 , 3/2 – 3 , 3/2	0	9193.26	(0.20)	50002
	1 – 0	2 , 3/2 – 3 , 3/2	0	9209.57	(0.20)	50002
	1 – 0	4 , 5/2 – 3 , 3/2	1	8972.41	(0.20)	50002
$^{79}Br^{37}Cl$	1 – 0	2 , 1/2 – 3 , 3/2	0	8559.58	(0.20)	50002
	1 – 0	3 , 5/2 – 3 , 3/2	0	8725.49	(0.20)	50002
	1 – 0	2 , 5/2 – 3 , 3/2	0	8733.84	(0.20)	50002
	1 – 0	4 , 5/2 – 3 , 3/2	0	8738.47	(0.20)	50002
	1 – 0	1 , 5/2 – 0 , 3/2	0	8745.17	(0.20)	50002
	1 – 0	3 , 3/2 – 3 , 3/2	0	8951.38	(0.20)	50002
	1 – 0	2 , 3/2 – 3 , 3/2	0	8964.19	(0.20)	50002
$^{81}Br^{37}Cl$	1 – 0	2 , 1/2 – 3 , 3/2	0	8525.53	(0.20)	50002
	1 – 0	3 , 5/2 – 3 , 3/2	0	8663.40	(0.20)	50002
	1 – 0	2 , 5/2 – 3 , 3/2	0	8671.87	(0.20)	50002
	1 – 0	4 , 5/2 – 3 , 3/2	0	8676.37	(0.20)	50002
	1 – 0	1 , 5/2 – 0 , 3/2	0	8683.06	(0.20)	50002
	1 – 0	3 , 3/2 – 3 , 3/2	0	8852.93	(0.20)	50002

BrCs

Cesium Bromide

	$^{133}Cs^{79}Br$		$^{133}Cs^{81}Br$	
Constant	Value (Unc.)[a]	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	1081.32897(84)	73001	1064.57659(91)[b]	73001
Y_{11} [MHz]	-3.71777(59)	73001	-3.63171(59)	
Y_{21} [kHz]	3.057(97)	73001	2.963(97)	
Y_{31} [kHz]	9.7(42)	73001	9.3(42)	
Y_{02} [kHz]	-251.239(60)	73001	-243.505(60)	
Y_{12} [kHz]	-0.191(26)	73001	-0.184(26)	
Y_{03} [Hz]	$-22.043(19)\times10^{-6}$	73001	$-21.034(19)\times10^{-6}$	
Y_{04} [Hz]	$-12.52(47)\times10^{-12}$	73001	$-11.76(47)\times10^{-12}$	
$eq_0Q(Cs)$ [MHz]	≤ 1.5	72001		
$eq_0Q(Br)$ [MHz]	-6.47(16)	72001	-5.41(15)	c
$eq_1Q(Br)$ [MHz]	-5.65(16)	72001	-4.72(15)	c
$eq_2Q(Br)$ [MHz]	-5.02(23)	72001	-4.19(20)	c
$eq_eQ(Br)$ [MHz]	-6.79(15)	72001	-5.67(15)	
μ_0 [D]	10.82(10)	68001		
$\|g_J\|_{v=0}$ [μ_n]	0.0099(10)	73001		
μ_r [amu]	49.516045		50.295240	

[a]Rotational constants from fit to data in 1019 and 73001.

[b]From fit to all data on $^{133}Cs^{79}Br$ and $^{133}Cs^{81}Br$ using the isotope relations for all other Dunham coefficients. The remaining rotational constants were calculated by the isotope relations from $^{133}Cs^{79}Br$.

[c]From ration $Q(^{79}Br)/Q(^{81}Br) = 1.1970568(15)$. [See Ref. 68003 and 66005] and eqQ values in Ref. 72001

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{133}Cs^{79}Br$	2 – 1	5/2 – 5/2	0	4316.357	(0.05)	72001
	2 – 1	3/2 – 1/2	0	4316.357	(0.05)	72001
	2 – 1	7/2 – 5/2	0	4318.024	(0.03)	72001
	2 – 1	5/2 – 3/2	0	4318.024	(0.03)	72001
	2 – 1	3/2 – 3/2	0	4319.190	(0.04)	72001
	2 – 1	5/2 – 5/2	1	4301.645	(0.04)	72001
	2 – 1	3/2 – 1/2	1	4301.645	(0.04)	72001
	2 – 1	7/2 – 5/2	1	4303.132	(0.03)	72001
	2 – 1	5/2 – 3/2	1	4303.132	(0.03)	72001
	2 – 1	3/2 – 3/2	1	4304.130	(0.04)	72001
	2 – 1	5/2 – 5/2	2	4287.008	(0.05)	72001
	2 – 1	3/2 – 1/2	2	4287.008	(0.05)	72001
	2 – 1	7/2 – 5/2	2	4288.314	(0.04)	72001
	2 – 1	5/2 – 3/2	2	4288.314	(0.04)	72001
	2 – 1	7/2 – 5/2	3	4273.510	(0.04)	72001
	2 – 1	5/2 – 3/2	3	4273.510	(0.04)	72001
	2 – 1	7/2 – 5/2	4	4258.711	(0.04)	72001
	2 – 1	5/2 – 3/2	4	4258.711	(0.04)	72001
	2 – 1	7/2 – 5/2	5	4243.981	(0.04)	72001
	2 – 1	5/2 – 3/2	5	4243.981	(0.04)	72001
	10 – 9		0	21588.57	(0.10)	65
	10 – 9		1	21514.48	(0.20)	65
	10 – 9		2	21440.65	(0.20)	65
	10 – 9		3	21336.36	(0.20)	65
	10 – 9		4	21292.40	(0.20)	65
	10 – 9		5	21218.66	(0.20)	65
	11 – 10		0	23747.17	(0.10)	65
	11 – 10		1	23665.60	(0.20)	65
	11 – 10		2	23583.87	(0.20)	65
	11 – 10		3	23502.95	(0.20)	65
	11 – 10		5	23340.26	(0.20)	65
	11 – 10		6	23259.19	(0.20)	65
	11 – 10		7	23178.25	(0.20)	65
	11 – 10		8	23097.97	(0.20)	65
	12 – 11		0	25905.552	(0.02)	73001
	12 – 11		1	25816.497	(0.02)	73001
	12 – 11		2	25727.541	(0.05)	73001
	12 – 11		3	25638.754	(0.02)	73001
	12 – 11		4	25550.145	(0.03)	73001
	12 – 11		5	25461.691	(0.03)	73001
	12 – 11		6	25373.278	(0.05)	73001
	12 – 11		7	25285.187	(0.02)	73001
	12 – 11		8	25197.135	(0.05)	73001
	12 – 11		9	25109.352	(0.05)	73001
	12 – 11		0	25021.567	(0.06)	73001
	12 – 11		1	24943.143	(0.06)	73001
	12 – 11		2	24846.683	(0.06)	73001
	12 – 11		3	24759.542	(0.06)	73001
	12 – 11		4	24672.445	(0.06)	73001
	12 – 11		5	24585.692	(0.08)	73001
	12 – 11		6	24498.911	(0.08)	73001
	12 – 11		7	24412.358	(0.08)	73001
	54 – 53		0	116424.56	(0.10)	1019
	54 – 53		1	116023.35	(0.10)	1019
	72 – 71		0	155068.30	(0.10)	1019
	73 – 72		0	157211.47	(0.10)	1019
	73 – 72		1	156669.12	(0.10)	1019
	73 – 72		2	156127.90	(0.10)	1019
	73 – 72		4	155048.02	(0.10)	1019
	74 – 73		3	157707.97	(0.10)	1019
	84 – 83		2	179507.76	(0.10)	1019
	84 – 83		3	178885.78	(0.10)	1019
	91 – 90		0	195705.22	(0.10)	1019
	92 – 91		1	197155.57	(0.10)	1019
$^{133}Cs^{81}Br$	10 – 9		0	21254.44	(0.10)	65
	11 – 10		0	23379.53	(0.10)	65
	11 – 10		1	23299.79	(0.20)	65
	11 – 10		2	23220.22	(0.20)	65
	11 – 10		3	23140.61	(0.20)	65
	11 – 10		4	23061.38	(0.20)	65
	12 – 11		0	25504.69	(0.10)	65
	73 – 72		0	154783.88	(0.10)	1019
	74 – 73		0	156893.66	(0.10)	1019
	74 – 73		1	156356.70	(0.10)	1019
	74 – 73		3	155285.45	(0.10)	1019
	84 – 83		0	177965.90	(0.10)	1019
	85 – 84		1	179453.83	(0.10)	1019
	92 – 91		0	194788.37	(0.10)	1019
	93 – 92		1	196213.95	(0.10)	1019

BrF

Bromine Monofluoride

		$^{79}Br^{19}F$		$^{81}Br^{19}F$	
Constant		Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01}	[MHz]	10706.95(50)	50001	10655.7	50001
Y_{11}	[MHz]	-78.2(5)	a	-77.9	a
eq_0Q (Br)	[MHz]	1089.0	50001	909.2	50001
μ_0	[D]	1.29	50001		
μ_r	[amu]	15.3122178		15.3859293	

[a] Recalculation from Ref. 50001.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{79}Br^{19}F$	1 – 0	1/2 – 3/2	0	20985.5	(0.50)	50001
	1 – 0	5/2 – 3/2	0	21202.6	(0.50)	50001
	1 – 0	3/2 – 3/2	0	21475.4	(0.50)	50001
	1 – 0	1/2 – 3/2	1	20828.9	(0.50)	50001
	1 – 0	5/2 – 3/2	1	21045.6	(0.50)	50001
	1 – 0	3/2 – 3/2	1	21319.4	(0.50)	50001
$^{81}Br^{19}F$	1 – 0	1/2 – 3/2	0	20928.4	(0.50)	50001
	1 – 0	5/2 – 3/2	0	21110.4	(0.50)	50001
	1 – 0	3/2 – 3/2	0	21337.5	(0.50)	50001
	1 – 0	1/2 – 3/2	1	20772.3	(0.50)	50001
	1 – 0	5/2 – 3/2	1	20954.6	(0.50)	50001
	1 – 0	3/2 – 3/2	1	21181.7	(0.50)	50001

BrGa

Gallium Monobromide

BrGa Gallium Monobromide

	$^{69}Ga^{79}Br$	$^{69}Ga^{81}Br$	$^{71}Ga^{79}Br$	$^{71}Ga^{81}Br$
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)
Y_{01} [MHz]	2482.026(30)	2453.454(30)	2444.682(30)	2416.110(30)
Y_{11} [MHz]	9.774(30)	9.606(30)	-9.554(30)	9.387(30)
Y_{02} [MHz]		-0.74(x)[c]		
$eq_0Q(Ga)$ [MHz]	-89.8(30)			
$eq_0Q(Br)$ [MHz]	108.6(30)			
μ_r [amu]	36.79212563	37.22058635	37.35415074	37.79588008
Ref.	a	b	b	b

[a]Recalculation from data in Ref. 509.

[b]Calculated from the values for $^{69}Ga^{79}Br$ by isotope relations.

[c]Ref. 509.

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{69}Ga^{79}Br$	5 – 4	5 – 4	0	24768.02	(0.20)	509
	5 – 4	8 – 7	0	24771.22	(0.20)	509
	5 – 4	6 – 6	0	24796.70	(0.50)	509
	5 – 4	5 – 5	0	24802.17	(0.50)	509
	5 – 4	8 – 7	1	24673.55	(0.20)	509
	5 – 4	8 – 7	2	24576.08	(0.20)	509
$^{69}Ga^{81}Br$	5 – 4	5 – 4	0	24483.58	(0.20)	509
	5 – 4	8 – 7	0	24486.56	(0.20)	509
	5 – 4	8 – 7	1	24390.37	(0.20)	509
	5 – 4	8 – 7	2	24294.26	(0.20)	509
$^{71}Ga^{79}Br$	5 – 4	8 – 7	0	24399.00	(0.20)	509
$^{71}Ga^{81}Br$	5 – 4	8 – 7	0	24114.00	(0.20)	509

BrH

Hydrogen Bromide

Isotopic Species	μ_r [amu]	ν_0 [MHz]	B_0 [MHz]	D_0 [MHz]	H_0 [Hz]	Ref.
$^1H^{79}Br$	0.99511709(9)	500673.9188(2)	250357.599(20)[a]	10.320(10)[a]	221(5)[a]	69000
$^1H^{81}Br$	0.99542702(9)	500519.1455(2)	250250.202(20)[a]	10.315(10)[a]	221(5)[a]	69000
$^2H^{79}Br$	1.96397883(20)	254704.6571(4)	127357.6343(60)[b]	2.6529(14)	28.7(10)[a]	71008,71002
$^2H^{81}Br$	1.96518641(20)	254548.9312(4)	127357.6343(60)[b]	2.6479(20)	28.7(10)[a]	71008,71002
$^3H^{79}Br$	2.90502727(30)	172499.05(30)	86251.95(16)[b]	1.2125(14)[a]		166
$^3H^{81}Br$	2.90767009(30)	172343.23(40)	86174.04(21)[b]	1.2095(20)[a]		166

Hyperfine Structure Constants

Isotopic Species	$eq_0Q(H)$ [MHz]	$eq_0Q(Br)$ [MHz]	c_H [kHz]	c_{Br} [kHz]	c_3 [kHz]	Ref.
$^1H^{79}Br$		532.3041(8)	-41.27(31)	290.83(8)	10.03(21)	69000
$^1H^{81}Br$		444.6793(8)	-41.23(31)	313.25(8)	10.89(21)	69000
$^2H^{79}Br$	0.1469(19)	530.6315(21)	-3.25(57)	145.82(24)	1.59(24)	71008
$^2H^{81}Br$	0.1461(19)	443.2799(21)	-3.55(57)	157.26(24)	1.74(24)	71008
$^3H^{79}Br$		530(2)				166
$^3H^{81}Br$		443(2)				166

Dipole Moments

Isotopic Species	μ_0 [D]	Ref.
$^1H^{79}Br$	0.8280(6)	70003
$^1H^{79}Br$	0.8271(3)	71008
$^1H^{81}Br$	0.8282(6)	70003
$^1H^{81}Br$	0.8271(3)	71008
$^2H^{79}Br$	0.8235(4)	71008
$^2H^{81}Br$	0.8233(4)	71008

Constant	$^1H^{81}Br$ Value (Unc.)	Ref.
Y_{01} [MHz]	253770.87(80)	65002
Y_{11} [MHz]	-6993.5(12)	65002
Y_{21} [MHz]	26.10(70)	65002
Y_{31} [MHz]	-3.61(12)	65002
Y_{02} [MHz]	-10.365(3)	65002
Y_{12} [kHz]	119(2)	65002
Y_{22} [kHz]	-11.4(10)	65002
Y_{03} [Hz]	229(5)	65002
Y_{13} [Hz]	16.5(20)	65002
Y_{10} [cm^{-1}]	2648.9752(70)	65002
Y_{20} [cm^{-1}]	-45.2175(30)	65002
Y_{30} [cm^{-1}]	-0.0029(10)	65002

[a]From a combination of data in Ref. 65002, 69000 and 70002 and isotopic dependence of this constant.

[b]Derived from a combination of ν_0, D_0 and H_0 shown here.

Additional references: 48, 230, 603, 604, 720, 998, 1195a, 1323.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{1}H^{79}Br$	1 – 0	0 , 1/2 – 1 , 3/2	0	500540.102	(0.01)	69000
	1 – 0	1 , 1/2 – 2 , 3/2	0	500540.136	(0.01)	69000
	1 – 0	3 , 5/2 – 2 , 3/2	0	500647.727	(0.01)	69000
	1 – 0	2 , 5/2 – 1 , 3/2	0	500647.770	(0.01)	69000
	1 – 0	2 , 3/2 – 1 , 3/2	0	500780.083	(0.01)	69000
	1 – 0	1 , 3/2 – 2 , 3/2	0	500780.123	(0.01)	69000
$^{1}H^{81}Br$	1 – 0	0 , 1/2 – 1 , 3/2	0	500407.175	(0.01)	69000
	1 – 0	1 , 1/2 – 2 , 3/2	0	500407.210	(0.01)	69000
	1 – 0	3 , 5/2 – 2 , 3/2	0	500497.368	(0.01)	69000
	1 – 0	2 , 5/2 – 1 , 3/2	0	500497.409	(0.01)	69000
	1 – 0	2 , 3/2 – 1 , 3/2	0	500607.759	(0.01)	69000
	1 – 0	1 , 3/2 – 2 , 3/2	0	500607.801	(0.01)	69000
$^{2}H^{79}Br$	1 – 0	1/2 – 3/2	0	254571.661	(0.05)	520
	1 – 0	5/2 – 3/2	0	254678.380	(0.05)	520
	1 – 0	3/2 – 3/2	0	254810.634	(0.05)	520
	2 – 1	3/2 – 3/2	0	509239.277	(0.05)	71002
	2 – 1	7/2 – 5/2	0	509334.512	(0.05)	71002
	2 – 1	1/2 – 1/2	0	509345.318	(0.05)	71002
	2 – 1	5/2 – 5/2	0	509466.718	(0.05)	71002
	2 – 1	3/2 – 1/2	0	509478.266	(0.05)	71002
	3 – 2	9/2 – 7/2	0	763853.201	(0.10)	71002
$^{2}H^{81}Br$	1 – 0	1/2 – 3/2	0	254437.641	(0.05)	520
	1 – 0	5/2 – 3/2	0	254526.984	(0.05)	520
	1 – 0	3/2 – 3/2	0	254637.448	(0.05)	520
	2 – 1	3/2 – 3/2	0	508945.406	(0.05)	71002
	2 – 1	7/2 – 5/2	0	509025.040	(0.05)	71002
	2 – 1	1/2 – 1/2	0	509033.958	(0.05)	71002
	2 – 1	5/2 – 5/2	0	509135.334	(0.05)	71002
	2 – 1	3/2 – 1/2	0	509145.066	(0.05)	71002
	3 – 2	9/2 – 7/2	0	763387.356	(0.20)	71002
$^{3}H^{79}Br$	1 – 0	5/2 – 3/2	0	172472.72	(0.50)	230
	1 – 0	3/2 – 3/2	0	172604.60	(0.50)	230
$^{3}H^{81}Br$	1 – 0	5/2 – 3/2	0	172320.96	(0.50)	230
	1 – 0	3/2 – 3/2	0	172431.49	(0.50)	230

BrI

Iodine Monobromide

	$^{127}I^{79}Br$		$^{127}I^{81}Br$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	1682.22(10)	748	1656.51(10)	748
Y_{11} [MHz]	-10.49(10)	748	-10.26(10)	748
$eq_0Q(I)$ [MHz]	-2731(60)	748	-2731(60)	748
$eq_0Q(Br)$ [MHz]	722(15)	748	603(15)	748
μ_r [amu]	48.6587937		49.4110368	

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{127}I^{79}Br$	5 – 4	2 , 7/2 – 1 , 5/2	0	16695.8	(2.0)	748
	5 – 4	5 , 7/2 – 4 , 5/2	0	16695.8	(2.0)	748
	5 – 4	3 , 9/2 – 2 , 7/2	0	16708.8	(2.0)	748
	5 – 4	4 , 5/2 – 3 , 3/2	0	16718.8	(2.0)	748
	5 – 4	6 , 9/2 – 5 , 7/2	0	16730.8	(2.0)	748
	5 – 4	3 , 7/2 – 2 , 5/2	0	16730.8	(2.0)	748
	5 – 4	4 , 7/2 – 3 , 5/2	0	16738.8	(2.0)	748
	5 – 4	4 , 9/2 – 3 , 7/2	0	16738.8	(2.0)	748
	5 – 4	1 , 5/2 – 0 , 3/2	0	16747.9	(2.0)	748
	5 – 4	5 , 9/2 – 4 , 7/2	0	16747.9	(2.0)	748
	5 – 4	3 , 5/2 – 2 , 3/2	0	16747.9	(2.0)	748
	5 – 4	4 , 11/2 – 3 , 9/2	0	16752.9	(2.0)	748
	5 – 4	7 , 11/2 – 6 , 9/2	0	16764.4	(2.0)	748
	5 – 4	5 , 11/2 – 4 , 9/2	0	16764.4	(2.0)	748
	5 – 4	6 , 11/2 – 5 , 9/2	0	16764.4	(2.0)	748
	5 – 4	9 , 15/2 – 8 , 13/2	0	16782.0	(2.0)	748
	5 – 4	6 , 15/2 – 5 , 13/2	0	16782.0	(2.0)	748
	5 – 4	8 , 15/2 – 7 , 13/2	0	16786.0	(2.0)	748
	5 – 4	8 , 13/2 – 7 , 11/2	0	16790.0	(2.0)	748
	5 – 4	7 , 15/2 – 6 , 13/2	0	16790.0	(2.0)	748
	5 – 4	7 , 13/2 – 6 , 11/2	0	16800.0	(2.0)	748
	5 – 4	5 , 13/2 – 4 , 11/2	0	16800.0	(2.0)	748
	5 – 4	6 , 13/2 – 5 , 11/2	0	16807.0	(2.0)	748
	5 – 4	3 , 9/2 – 2 , 7/2	1	16607.1	(5.0)	748
	5 – 4	4 , 5/2 – 3 , 3/2	1	16607.1	(5.0)	748
	5 – 4	6 , 9/2 – 5 , 7/2	1	16618.6	(5.0)	748
	5 – 4	4 , 7/2 – 3 , 5/2	1	16636.6	(5.0)	748
	5 – 4	4 , 9/2 – 3 , 7/2	1	16636.6	(5.0)	748
	5 – 4	1 , 5/2 – 0 , 3/2	1	16636.6	(5.0)	748
	5 – 4	5 , 9/2 – 4 , 7/2	1	16644.3	(5.0)	748
	5 – 4	3 , 5/2 – 2 , 3/2	1	16644.3	(5.0)	748
	5 – 4	4 , 11/2 – 3 , 9/2	1	16644.3	(5.0)	748
	5 – 4	7 , 11/2 – 6 , 9/2	1	16660.6	(2.0)	748
	5 – 4	5 , 11/2 – 4 , 9/2	1	16660.6	(2.0)	748
	5 – 4	6 , 11/2 – 5 , 9/2	1	16660.6	(2.0)	748
	5 – 4	9 , 15/2 – 8 , 13/2	1	16676.7	(2.0)	748
	5 – 4	6 , 15/2 – 5 , 13/2	1	16676.7	(2.0)	748
	5 – 4	8 , 15/2 – 7 , 13/2	1	16680.7	(2.0)	748
	5 – 4	8 , 13/2 – 7 , 11/2	1	16683.7	(2.0)	748
	5 – 4	7 , 15/2 – 6 , 13/2	1	16683.7	(2.0)	748
	5 – 4	7 , 13/2 – 6 , 11/2	1	16695.8	(2.0)	748
	5 – 4	5 , 13/2 – 4 , 11/2	1	16695.8	(2.0)	748
	5 – 4	6 , 13/2 – 5 , 11/2	1	16708.8	(2.0)	748
	5 – 4	6 , 15/2 – 5 , 13/2	2	16573.9	(5.0)	748
	5 – 4	8 , 15/2 – 7 , 13/2	2	16573.9	(5.0)	748
	5 – 4	8 , 13/2 – 7 , 11/2	2	16581.4	(5.0)	748
	5 – 4	7 , 15/2 – 6 , 13/2	2	16581.4	(5.0)	748
	5 – 4	5 , 13/2 – 4 , 11/2	2	16595.5	(5.0)	748
	5 – 4	6 , 13/2 – 5 , 11/2	2	16595.5	(5.0)	748
	6 – 5	7 , 11/2 – 6 , 9/2	0	20072.9	(0.5)	748
	6 – 5	6 , 9/2 – 5 , 7/2	0	20072.9	(0.5)	748
	6 – 5	3 , 9/2 – 2 , 7/2	0	20084.3	(0.5)	748
	6 – 5	5 , 7/2 – 4 , 5/2	0	20088.4	(0.5)	748
	6 – 5	6 , 11/2 – 5 , 9/2	0	20104.1	(0.5)	748
	6 – 5	5 , 11/2 – 4 , 9/2	0	20104.1	(0.5)	748
	6 – 5	4 , 7/2 – 3 , 5/2	0	20107.7	(0.5)	748
	6 – 5	2 , 7/2 – 1 , 5/2	0	20107.7	(0.5)	748
	6 – 5	8 , 13/2 – 7 , 11/2	0	20117.1	(0.5)	748
	6 – 5	5 , 13/2 – 4 , 11/2	0	20117.1	(0.5)	748
	6 – 5	7 , 13/2 – 6 , 11/2	0	20117.1	(0.5)	748
	6 – 5	6 , 13/2 – 5 , 11/2	0	20125.9	(0.5)	748
	6 – 5	10 , 17/2 – 9 , 15/2	0	20132.2	(0.5)	748
	6 – 5	7 , 17/2 – 6 , 15/2	0	20134.8	(0.5)	748
	6 – 5	9 , 17/2 – 8 , 15/2	0	20134.8	(0.5)	748
	6 – 5	9 , 15/2 – 8 , 13/2	0	20138.1	(0.5)	748
	6 – 5	8 , 17/2 – 7 , 15/2	0	20138.1	(0.5)	748
	6 – 5	8 , 15/2 – 7 , 13/2	0	20145.6	(0.5)	748
	6 – 5	6 , 15/2 – 5 , 13/2	0	20145.6	(0.5)	748
	6 – 5	7 , 15/2 – 6 , 13/2	0	20177.5	(0.5)	748
	6 – 5	7 , 11/2 – 6 , 9/2	1	19947.2	(1.0)	748
	6 – 5	6 , 9/2 – 5 , 7/2	1	19947.2	(1.0)	748
	6 – 5	3 , 9/2 – 2 , 7/2	1	19957.9	(1.0)	748
	6 – 5	5 , 7/2 – 4 , 5/2	1	19964.3	(1.0)	748
	6 – 5	4 , 11/2 – 3 , 9/2	1	19964.3	(1.0)	748
	6 – 5	4 , 9/2 – 3 , 7/2	1	19971.3	(1.0)	748
	6 – 5	5 , 9/2 – 4 , 7/2	1	19974.2	(1.0)	748
	6 – 5	6 , 11/2 – 5 , 9/2	1	19979.0	(1.0)	748
	6 – 5	5 , 11/2 – 4 , 9/2	1	19979.0	(1.0)	748
	6 – 5	4 , 7/2 – 3 , 5/2	1	19983.1	(1.0)	748
	6 – 5	2 , 7/2 – 1 , 5/2	1	19983.1	(1.0)	748
	6 – 5	8 , 13/2 – 7 , 11/2	1	19991.1	(1.0)	748
	6 – 5	5 , 13/2 – 4 , 11/2	1	19991.1	(1.0)	748
	6 – 5	7 , 13/2 – 6 , 11/2	1	19991.1	(1.0)	748
	6 – 5	10 , 17/2 – 9 , 15/2	1	20005.2	(1.0)	748

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{127}I^{79}Br$	6 – 5	7 , 17/2 – 6 , 15/2	1	20005.2	(1.0)	748
	6 – 5	6 , 15/2 – 5 , 13/2	1	20017.4	(1.0)	748
	6 – 5	8 , 15/2 – 7 , 13/2	1	20017.4	(1.0)	748
	6 – 5	7 , 15/2 – 6 , 13/2	1	20051.5	(1.0)	748
	6 – 5	10 , 17/2 – 9 , 15/2	2	19878.8	(2.0)	748
	6 – 5	7 , 17/2 – 6 , 15/2	2	19878.8	(2.0)	748
	6 – 5	8 , 17/2 – 7 , 15/2	2	19887.4	(2.0)	748
	6 – 5	9 , 15/2 – 8 , 13/2	2	19887.4	(2.0)	748
	6 – 5	6 , 15/2 – 5 , 13/2	2	19892.1	(2.0)	748
	6 – 5	8 , 15/2 – 7 , 13/2	2	19892.1	(2.0)	748
	6 – 5	7 , 15/2 – 6 , 13/2	2	19924.8	(2.0)	748
$^{127}I^{81}Br$	5 – 4	2 , 7/2 – 1 , 5/2	0	16440.1	(1.0)	748
	5 – 4	5 , 7/2 – 4 , 5/2	0	16440.1	(1.0)	748
	5 – 4	6 , 9/2 – 5 , 7/2	0	16469.2	(1.0)	748
	5 – 4	3 , 7/2 – 2 , 5/2	0	16472.2	(1.0)	748
	5 – 4	4 , 7/2 – 3 , 5/2	0	16481.2	(1.0)	748
	5 – 4	4 , 9/2 – 3 , 7/2	0	16481.2	(1.0)	748
	5 – 4	5 , 9/2 – 4 , 7/2	0	16485.2	(1.0)	748
	5 – 4	1 , 5/2 – 0 , 3/2	0	16485.2	(1.0)	748
	5 – 4	7 , 11/2 – 6 , 9/2	0	16506.3	(1.0)	748
	5 – 4	2 , 5/2 – 1 , 3/2	0	16513.3	(1.0)	748
	5 – 4	6 , 11/2 – 5 , 9/2	0	16513.3	(1.0)	748
	5 – 4	5 , 11/2 – 4 , 9/2	0	16513.3	(1.0)	748
	5 – 4	9 , 15/2 – 8 , 13/2	0	16526.3	(1.0)	748
	5 – 4	6 , 15/2 – 5 , 13/2	0	16526.3	(1.0)	748
	5 – 4	8 , 15/2 – 7 , 13/2	0	16530.3	(1.0)	748
	5 – 4	7 , 15/2 – 6 , 13/2	0	16530.3	(1.0)	748
	5 – 4	8 , 13/2 – 7 , 11/2	0	16538.3	(1.0)	748
	5 – 4	5 , 13/2 – 4 , 11/2	0	16538.3	(1.0)	748
	5 – 4	7 , 13/2 – 6 , 11/2	0	16542.9	(1.0)	748
	5 – 4	6 , 13/2 – 5 , 11/2	0	16551.4	(1.0)	748
	5 – 4	4 , 5/2 – 3 , 3/2	1	16359.7	(2.0)	748
	5 – 4	6 , 9/2 – 5 , 7/2	1	16364.7	(2.0)	748
	5 – 4	3 , 5/2 – 2 , 3/2	1	16389.9	(2.0)	748
	5 – 4	4 , 11/2 – 3 , 9/2	1	16399.0	(2.0)	748
	5 – 4	7 , 11/2 – 6 , 9/2	1	16404.0	(2.0)	748
	5 – 4	8 , 15/2 – 7 , 13/2	1	16429.6	(2.0)	748
	5 – 4	7 , 15/2 – 6 , 13/2	1	16429.6	(2.0)	748
	5 – 4	8 , 13/2 – 7 , 11/2	1	16429.6	(2.0)	748
	5 – 4	5 , 13/2 – 4 , 11/2	1	16433.6	(2.0)	748
	5 – 4	7 , 13/2 – 6 , 11/2	1	16439.6	(2.0)	748
	5 – 4	9 , 15/2 – 8 , 13/2	2	16321.4	(5.0)	748
	5 – 4	6 , 15/2 – 5 , 13/2	2	16321.4	(5.0)	748
	5 – 4	8 , 15/2 – 7 , 13/2	2	16325.4	(5.0)	748
	5 – 4	7 , 15/2 – 6 , 13/2	2	16325.4	(5.0)	748
	5 – 4	7 , 13/2 – 6 , 11/2	2	16325.4	(5.0)	748
	6 – 5	7 , 11/2 – 6 , 9/2	0	19768.4	(1.0)	748
	6 – 5	6 , 9/2 – 5 , 7/2	0	19768.4	(1.0)	748
	6 – 5	3 , 9/2 – 2 , 7/2	0	19774.8	(1.0)	748
	6 – 5	4 , 11/2 – 3 , 9/2	0	19783.7	(1.0)	748
	6 – 5	5 , 7/2 – 4 , 5/2	0	19783.7	(1.0)	748
	6 – 5	4 , 9/2 – 3 , 7/2	0	19788.8	(1.0)	748
	6 – 5	6 , 11/2 – 5 , 9/2	0	19795.0	(1.0)	748
	6 – 5	5 , 11/2 – 4 , 9/2	0	19795.0	(1.0)	748
	6 – 5	7 , 13/2 – 6 , 11/2	0	19814.8	(1.0)	748
	6 – 5	6 , 13/2 – 5 , 11/2	0	19819.0	(1.0)	748
	6 – 5	10 , 17/2 – 9 , 15/2	0	19824.9	(1.0)	748
	6 – 5	7 , 17/2 – 6 , 15/2	0	19826.6	(1.0)	748
	6 – 5	9 , 17/2 – 8 , 15/2	0	19826.6	(1.0)	748
	6 – 5	9 , 15/2 – 8 , 13/2	0	19831.5	(1.0)	748
	6 – 5	6 , 15/2 – 5 , 13/2	0	19837.3	(1.0)	748
	6 – 5	8 , 15/2 – 7 , 13/2	0	19837.3	(1.0)	748
	6 – 5	7 , 15/2 – 6 , 13/2	0	19862.6	(1.0)	748
	6 – 5	7 , 11/2 – 6 , 9/2	1	19643.2	(1.0)	748
	6 – 5	6 , 9/2 – 5 , 7/2	1	19643.2	(1.0)	748
	6 – 5	4 , 9/2 – 3 , 7/2	1	19666.0	(1.0)	748
	6 – 5	6 , 11/2 – 5 , 9/2	1	19672.0	(1.0)	748
	6 – 5	5 , 11/2 – 4 , 9/2	1	19674.6	(1.0)	748
	6 – 5	7 , 13/2 – 6 , 11/2	1	19690.4	(1.0)	748
	6 – 5	10 , 17/2 – 9 , 15/2	1	19702.7	(1.0)	748
	6 – 5	7 , 17/2 – 6 , 15/2	1	19702.7	(1.0)	748
	6 – 5	9 , 17/2 – 8 , 15/2	1	19703.7	(1.0)	748
	6 – 5	8 , 17/2 – 7 , 15/2	1	19708.2	(1.0)	748
	6 – 5	9 , 15/2 – 8 , 13/2	1	19708.2	(1.0)	748
	6 – 5	6 , 15/2 – 5 , 13/2	1	19713.9	(1.0)	748
	6 – 5	18 , 15/2 – 7 , 13/2	1	19713.9	(1.0)	748
	6 – 5	7 , 15/2 – 6 , 13/2	1	19740.2	(1.0)	748

BrIn

Indium Monobromide

	$^{115}In^{79}Br$		$^{115}In^{81}Br$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	1670.130(30)	a	1645.683(30)	b
Y_{11} [MHz]	-5.684(20)	a	-5.560(20)	b
Y_{02} [kHz]	-0.43(X)	509		
$eq_0Q(In)$[MHz]	-638.9(50)	a		
$eq_0Q(Br)$[MHz]	+119(10)	a		
μ_r [amu]	46.785259		47.480276	

[a]recalculation of the data of Ref. 509.

[b]calculated from isotope $^{115}In^{79}Br$.

All observed transitions are composed of many overlapped hyperfine structure lines, but only one component is listed here to limit the number of lines to those actually measured.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{79}Br$	7 − 6	10 , 19/2 − 10 , 19/2	0	23308.30	(0.40)	509
	7 − 6	6 , 9/2 − 5 , 7/2	0	23328.97	(0.40)	509
	7 − 6	5 , 7/2 − 4 , 5/2	0	23331.51	(0.40)	509
	7 − 6	5 , 11/2 − 4 , 9/2	0	23334.50	(0.40)	509
	7 − 6	7 , 13/2 − 6 , 11/2	0	23335.55	(0.40)	509
	7 − 6	9 , 17/2 − 8 , 15/2	0	23339.12	(0.40)	509
	7 − 6	8 , 15/2 − 7 , 13/2	0	23341.01	(0.40)	509
	7 − 6	12 , 23/2 − 11 , 21/2	0	23343.33	(0.40)	509
	7 − 6	12 , 21/2 − 11 , 19/2	0	23345.07	(0.40)	509
	7 − 6	11 , 21/2 − 10 , 19/2	0	23346.51	(0.40)	509
	7 − 6	8 , 13/2 − 8 , 13/2	0	23353.40	(0.40)	509
	7 − 6	6 , 13/2 − 6 , 13/2	0	23358.74	(0.40)	509
	7 − 6	5 , 7/2 − 5 , 7/2	0	23361.35	(0.40)	509
	7 − 6	6 , 9/2 − 6 , 9/2	0	23362.70	(0.40)	509
	7 − 6	6 , 11/2 − 6 , 11/2	0	23365.60	(0.40)	509
	7 − 6	10 , 19/2 − 10 , 17/2	0	23367.97	(0.40)	509
	7 − 6	10 , 19/2 − 10 , 19/2	1	23228.68	(0.40)	509
	7 − 6	12 , 23/2 − 11 , 21/2	1	23263.76	(0.40)	509
	7 − 6	6 , 13/2 − 6 , 13/2	1	23279.09	(0.40)	509
	7 − 6	5 , 7/2 − 5 , 7/2	1	23282.61	(0.40)	509
	7 − 6	6 , 11/2 − 6 , 11/2	1	23285.37	(0.40)	509
	7 − 6	10 , 19/2 − 10 , 17/2	1	23287.37	(0.40)	509

BrK

Potassium Bromide

	$^{39}K^{79}Br$		$^{39}K^{81}Br$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	2434.947(5)[a]	53000	2415.075(5)	53000
Y_{11} [MHz]	-12.136(5)	53000	-11.987(5)	53000
Y_{21} [MHz]	0.023(5)	53000	0.022(5)	53000
Y_{02} [kHz]	-1.3376(10)	1019	-1.3159(10)	1019
$eq_0Q(K)$ [MHz]	-5.0151(9)	69002	-5.0125(11)	69002
$eq_1Q(K)$ [MHz]	-4.9781(16)	69002	-4.9757(14)	69002
$eq_2Q(K)$ [MHz]	-4.9429(31)	69002	-4.9404(24)	69002
$eq_eQ(K)$ [MHz]	-5.0343(28)	69002	-5.0315(28)	69002
$eq_0Q(Br)$ [MHz]	10.2383(7)	69002	8.5513(10)	69002
$eq_1Q(Br)$ [MHz]	11.2194(12)	69002	9.3692(13)	69002
$eq_2Q(Br)$ [MHz]	12.1907(89)	69002	10.1817(39)	69002
$eq_eQ(Br)$ [MHz]	9.7442(39)	69002	8.1403(29)	69002
c_K [kHz]	0.27(21)	69002	0.10(35)	69002
c_{Br} [kHz]	1.23(16)	69002	1.28(29)	69002
μ_0 [D]	10.6278(10)	69002	10.6277(10)	69002
μ_1 [D]	10.6786(10)	69002	10.6783(10)	69002
μ_2 [D]	10.7293(10)	69002	10.7289(10)	69002
μ_e [D]	10.6026(10)	69002	10.6026(10)	69002
μ_r [amu]	26.0849820		26.2996231	

[a]Larger error assumed than given in Ref. 53000.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{39}K^{79}Br$	1 − 0	2 , 3/2 − 3 , 3/2	0	4854.856	(0.01)	53000
	1 − 0	3 , 3/2 − 3 , 3/2	0	4856.588	(0.01)	53000
	1 − 0	2 , 5/2 − 3 , 3/2	0	4857.383	(0.01)	53000
	1 − 0	4 , 5/2 − 3 , 3/2	0	4857.502	(0.01)	53000
	1 − 0	3 , 5/2 − 3 , 3/2	0	4859.740	(0.01)	53000
	1 − 0	2 , 1/2 − 3 , 3/2	0	4860.523	(0.01)	53000
	1 − 0	2 , 3/2 − 3 , 3/2	1	4830.463	(0.01)	53000
	1 − 0	3 , 3/2 − 3 , 3/2	1	4832.362	(0.01)	53000
	1 − 0	2 , 5/2 − 3 , 3/2	1	4833.143	(0.01)	53000
	1 − 0	4 , 5/2 − 3 , 3/2	1	4833.270	(0.01)	53000
	1 − 0	3 , 5/2 − 3 , 3/2	1	4835.733	(0.01)	53000
	1 − 0	2 , 1/2 − 3 , 3/2	1	4836.530	(0.01)	53000
	1 − 0	2 , 3/2 − 3 , 3/2	2	4806.153	(0.01)	53000
	1 − 0	3 , 3/2 − 3 , 3/2	2	4808.247	(0.01)	53000
	1 − 0	2 , 5/2 − 3 , 3/2	2	4808.990	(0.01)	53000
	1 − 0	4 , 5/2 − 3 , 3/2	2	4809.129	(0.01)	53000
	1 − 0	3 , 5/2 − 3 , 3/2	2	4811.835	(0.01)	53000
	1 − 0	2 , 1/2 − 3 , 3/2	2	4812.622	(0.01)	53000
	21 − 20		0	101963.70	(0.10)	1019
	21 − 20		1	101455.71	(0.10)	1019
	22 − 21		0	106813.95	(0.10)	1019
	32 − 31		0	155273.22	(0.10)	1019
	32 − 31		1	154499.55	(0.10)	1019
	40 − 39		0	193968.20	(0.10)	1019
	40 − 39		1	193001.15	(0.10)	1019
	40 − 39		2	192037.50	(0.10)	1019
$^{39}K^{81}Br$	1 − 0	1 , 3/2 − 3 , 3/2	0	4815.884	(0.01)	53000
	1 − 0	3 , 3/2 − 3 , 3/2	0	4817.056	(0.01)	53000
	1 − 0	2 , 5/2 − 3 , 3/2	0	4817.909	(0.01)	53000
	1 − 0	4 , 5/2 − 3 , 3/2	0	4817.992	(0.01)	53000
	1 − 0	1 , 5/2 − 3 , 3/2	0	4818.143	(0.01)	53000
	1 − 0	3 , 5/2 − 3 , 3/2	0	4819.815	(0.01)	53000
	1 − 0	1 , 1/2 − 3 , 3/2	0	4820.130	(0.01)	53000
	1 − 0	2 , 1/2 − 3 , 3/2	0	4820.613	(0.01)	53000
	1 − 0	3 , 5/2 − 3 , 3/2	1	4793.140	(0.01)	53000
	1 − 0	2 , 1/2 − 3 , 3/2	1	4794.062	(0.01)	53000
	21 − 20		0	101132.87	(0.10)	1019
	22 − 21		0	105943.73	(0.10)	1019
	32 − 31		0	154009.07	(0.10)	1019
	40 − 39		0	192389.96	(0.10)	1019

BrLi

Lithium Bromide

	$^6Li^{79}Br$	$^6Li^{81}Br$		$^7Li^{79}Br$	$^7Li^{81}Br$	
Constant	Value (Unc.)	Value (Unc.)	Ref.	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	19194.774(50)	19161.206(50)	1185	16650.32(10)	16616.78(10)	1019
Y_{11} [MHz]	-209.442(77)	-208.895(77)	1185	-169.09(20)	-168.58(20)	65
Y_{21} [MHz]	0.973(30)	0.970(30)	1185	0.656(80)	0.653(80)	65
Y_{02} [kHz]	-85.99(45)		1185[a]	-64.71(25)	-64.8(20)	1019
Y_{12} [kHz]	-0.39(35)		1185[a]			
$eq_0Q(Li)$ [MHz]	0.0043(2)	0.0043(2)	68003	0.21104(10)	0.21103(13)	72002
$eq_1Q(Li)$ [MHz]	0.0043(4)	0.0043(4)	68003			
$eq_2Q(Li)$ [MHz]	0.0043(6)	0.0043(6)	68003			
$eq_eQ(Li)$ [MHz]	0.0043(3)	0.0043(3)	68003	0.184(50)		52000
$eq_0Q(Br)$ [MHz]	38.46392(30)	32.13106(30)	68003	38.26810(14)	32.05086(5)	72002
$eq_1Q(Br)$ [MHz]	41.30701(40)	34.50411(40)	68003			
$eq_2Q(Br)$ [MHz]	44.06971(50)	36.81041(50)	68003			
$eq_3Q(Br)$ [MHz]	46.751(5)	39.046(5)	1185			
$eq_4Q(Br)$ [MHz]	49.355(5)	41.222(5)	1185			
$eq_5Q(Br)$ [MHz]	51.883(5)		1185			
$eq_eQ(Br)$ [MHz]	37.01223(85)	30.91950(85)	68003			
c_{Li} [kHz]	0.22(13)	0.22(13)	68003	0.859(15)	0.815(19)	72002
c_{Br} [kHz]	9.04(10)	9.75(10)	68003	7.8816(58)	8.4740(74)	72002
c_3 [kHz]				1.0710(61)	1.1789(78)	72002
c_4 [kHz]				0.0604(70)	0.0711(89)	72002
μ_0 [D]	7.2680(10)	7.2678(10)	1185	6.2(10)		65
μ_1 [D]	7.3523(10)	7.3521(10)	1185			
μ_2 [D]	7.4377(10)	7.4376(10)	1185			
μ_e [D]	7.2262(11)	7.2261(10)	1185			
μ_r [amu]	5.5891227	5.5989136		6.4431916	6.4562068	

[a]Calculated by isotope relations from $^7Li^{79}Br$ values in Ref. 1019.

Isotopic Species	J′ ← J″	F′ F₁′ ← F″ F₁″	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{6}Li^{79}Br$	1 – 0	1/2 – 3/2	0	38170.600	(0.02)	1185
	1 – 0	5/2 – 3/2	0	38178.366	(0.02)	1185
	1 – 0	3/2 – 3/2	0	38187.936	(0.02)	1185
	1 – 0	1/2 – 3/2	1	37754.895	(0.03)	1185
	1 – 0	5/2 – 3/2	1	37763.228	(0.03)	1185
	1 – 0	3/2 – 3/2	1	37773.510	(0.03)	1185
	1 – 0	1/2 – 3/2	2	37343.087	(0.05)	1185
	1 – 0	5/2 – 3/2	2	37351.973	(0.05)	1185
	1 – 0	3/2 – 3/2	2	37362.945	(0.05)	1185
$^{6}Li^{81}Br$	1 – 0	1/2 – 3/2	0	38105.600	(0.02)	1185
	1 – 0	5/2 – 3/2	0	38112.105	(0.02)	1185
	1 – 0	3/2 – 3/2	0	38120.088	(0.02)	1185
	1 – 0	1/2 – 3/2	1	37691.093	(0.05)	1185
	1 – 0	5/2 – 3/2	1	37698.072	(0.05)	1185
	1 – 0	3/2 – 3/2	1	37706.649	(0.05)	1185
$^{7}Li^{79}Br$	1 – 0	1/2 – 3/2	0	33122.44	(0.50)	65
	1 – 0	5/2 – 3/2	0	33130.30	(0.20)	65
	1 – 0	3/2 – 3/2	0	33139.50	(0.20)	65
	1 – 0	5/2 – 3/2	2	32461.52	(0.20)	65
	3 – 2	7/2 – 5/2	0	99388.21	(0.10)	1019
	3 – 2	9/2 – 7/2	0	99388.21	(0.10)	1019
	3 – 2	3/2 – 1/2	0	99390.39	(0.20)	1019
	3 – 2	5/2 – 3/2	0	99390.39	(0.20)	1019
	4 – 3	11/2 – 9/2	0	132510.64	(0.10)	1019
	4 – 3	9/2 – 7/2	0	132510.64	(0.10)	1019
	4 – 3	7/2 – 5/2	0	132511.83	(0.20)	1019
	4 – 3	5/2 – 3/2	0	132511.83	(0.20)	1019
	6 – 5		0	198735.33	(0.20)	1019
$^{7}Li^{81}Br$	1 – 0	1/2 – 3/2	0	33057.54	(0.50)	65
	1 – 0	5/2 – 3/2	0	33063.96	(0.20)	65
	1 – 0	3/2 – 3/2	0	33071.53	(0.20)	65
	1 – 0	1/2 – 3/2	1	32722.60	(0.20)	65
	1 – 0	5/2 – 3/2	1	32729.14	(0.20)	65
	1 – 0	3/2 – 3/2	1	32737.53	(0.20)	65
	1 – 0	5/2 – 3/2	2	32397.13	(0.20)	65
	5 – 4	13/2 – 11/2	0	165294.10	(0.20)	1019
	5 – 4	11/2 – 9/2	0	165294.10	(0.20)	1019
	6 – 5		0	198335.75	(0.20)	1019

BrNa

Sodium Bromide

	$^{23}Na^{79}Br$		$^{23}Na^{81}Br$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	4534.4603(32)	1019	4509.1958(55)	1019
Y_{11} [MHz]	-28.2091(38)	1019	-27.9688(66)	1019
Y_{21} [MHz]	0.0729(12)	1019	0.0714(16)	1019
Y_{02} [kHz]	-4.6574(54)	1019	-4.5950(70)	1019
Y_{12} [kHz]	0.0149(28)	1019	0.0087(62)	1019
$eq_0Q(Na)$ [MHz]	-4.82(8)	68023	-4.82(7)	68023
$eq_1Q(Na)$ [MHz]	-4.77(8)	68023	-4.77(8)	68023
$eq_2Q(Na)$ [MHz]	-4.72(9)	68023	-4.72(8)	68023
$eq_3Q(Na)$ [MHz]	-4.67(10)	68023		
$eq_eQ(Na)$ [MHz]	-4.84(8)	68023	-4.84(8)	68023
$eq_0Q(Br)$ [MHz]	58.06(8)	68023	48.55(9)	68023
$eq_1Q(Br)$ [MHz]	59.16(11)	68023	49.70(9)	68023
$eq_2Q(Br)$ [MHz]	60.30(10)	68023	50.85(11)	68023
$eq_3Q(Br)$ [MHz]	61.40(15)	68023		
$eq_eQ(Br)$ [MHz]	57.50(13)	68023	47.98(10)	68023
μ_0 [D]	9.1183(6)	68000	9.1183(6)	68000
μ_1 [D]	9.1715(6)	68000	9.1715(6)	68000
μ_2 [D]	9.2246(6)	68000	9.2245(8)	68000
μ_e [D]	9.0918(13)	68000	9.0918(13)	68000
μ_r [amu]	17.8034355		17.9031610	

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{23}Na^{79}Br$	2 – 1	3/2 – 3/2	0	18070.07	(0.10)	65
	2 – 1	7/2 – 5/2	0	18080.13	(0.10)	65
	2 – 1	5/2 – 3/2	0	18080.13	(0.10)	65
	2 – 1	5/2 – 5/2	0	18095.95	(0.20)	65
	2 – 1	3/2 – 1/2	0	18095.95	(0.20)	65
	2 – 1	7/2 – 5/2	1	17968.42	(0.20)	65
	2 – 1	5/2 – 3/2	1	17968.42	(0.20)	65
	2 – 1	5/2 – 5/2	1	17982.5	(1.00)	65
	2 – 1	3/2 – 1/2	1	17982.5	(1.00)	65
	2 – 1	7/2 – 5/2	2	17856.57	(0.10)	65
	2 – 1	5/2 – 3/2	2	17856.57	(0.10)	65
	3 – 2	9/2 – 7/2	1	26952.98	(0.20)	65
	3 – 2	7/2 – 5/2	1	26952.98	(0.20)	65
	3 – 2	5/2 – 3/2	1	26956.30	(0.50)	65
	3 – 2	3/2 – 1/2	1	26956.30	(0.50)	65
	3 – 2	9/2 – 7/2	2	26785.63	(0.20)	65
	3 – 2	7/2 – 5/2	2	26785.63	(0.20)	65
	3 – 2	5/2 – 3/2	2	26789.51	(0.50)	65
	3 – 2	3/2 – 1/2	2	26789.51	(0.50)	65
	3 – 2	9/2 – 7/2	3	26621.8	(1.00)	65
	3 – 2	7/2 – 5/2	3	26621.8	(1.00)	65
	3 – 2	9/2 – 7/2	4	26455.8	(1.00)	65
	3 – 2	7/2 – 5/2	4	26455.8	(1.00)	65
	12 – 11		0	108456.85	(0.10)	1019
	12 – 11		1	107783.39	(0.10)	1019
	13 – 12		0	117488.93	(0.10)	1019
	13 – 12		1	116759.38	(0.10)	1019
	13 – 12		2	116033.62	(0.10)	1019
	16 – 15		0	144575.72	(0.10)	1019
	17 – 16		0	153601.28	(0.10)	1019
	21 – 20		0	189683.49	(0.10)	1019
	21 – 20		1	188505.34	(0.10)	1019
	21 – 20		2	187333.37	(0.10)	1019
$^{23}Na^{81}Br$	2 – 1	7/2 – 5/2	0	17980.48	(0.20)	65
	2 – 1	5/2 – 3/2	0	17980.48	(0.20)	65
	2 – 1	3/2 – 3/2	0	17971.0	(1.00)	65
	2 – 1	7/2 – 5/2	1	17868.49	(0.10)	65
	2 – 1	5/2 – 3/2	1	17868.49	(0.10)	65
	3 – 2	9/2 – 7/2	1	26803.55	(0.20)	65
	3 – 2	7/2 – 5/2	1	26803.55	(0.20)	65
	3 – 2	5/2 – 3/2	1	26806.32	(0.50)	65
	3 – 2	3/2 – 1/2	1	26806.32	(0.50)	65
	3 – 2	9/2 – 7/2	2	26639.9	(1.00)	65
	3 – 2	7/2 – 5/2	2	26639.9	(1.00)	65
	3 – 2	5/2 – 3/2	2	26643.2	(1.00)	65
	3 – 2	3/2 – 1/2	2	26643.2	(1.00)	65
	3 – 2	9/2 – 7/2	3	26475.0	(1.00)	65
	3 – 2	7/2 – 5/2	3	26475.0	(1.00)	65
	12 – 11		0	107853.84	(0.10)	1019
	12 – 11		1	107186.03	(0.10)	1019
	13 – 12		0	116835.58	(0.10)	1019
	13 – 12		1	116112.12	(0.10)	1019
	17 – 16		0	152747.53	(0.10)	1019
	17 – 16		1	151801.77	(0.10)	1019
	17 – 16		2	150860.60	(0.10)	1019
	20 – 19		0	179662.30	(0.10)	1019
	20 – 19		1	178549.47	(0.10)	1019
	21 – 20		0	188629.57	(0.10)	1019
	21 – 20		1	187461.19	(0.10)	1019

BrO

Bromine Monoxide

	^{79}BrO		^{81}BrO		
Constant	v=0	v=1	v=0	v=1	Ref.
B_{eff} [MHz]	12824.49(5)	12715.41(11)	12771.27(9)	12662.89(16)	72012
$h = a+(\frac{b+c}{2})$[MHz]	504.68(35)	495.9(16)	544.08(64)	534.6(20)	72012
eqQ(Br) [MHz]	650.6(16)	654.2(42)	543.0(30)	545.2(60)	72012
μ_0 [D]	1.765(23)		1.794(49)		72012
A [cm^{-1}]	-815(120)		-815(120)		70042
Y_{01} [MHz]	12887(20)		12833(20)		72012
Y_{11} [MHz]	-21.82(50)		-21.68(60)		a
μ_r [amu]	13.2994293		13.355000		

[a]Calculated from data in Reference 72012.

Additional reference: 1597, 71018

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Parity	Ref.
$^{79}Br^{16}O$ $^2\Pi_{3/2}$	5/2 – 3/2	2 – 3	0	63364.17	(0.10)		72012
	5/2 – 3/2	3 – 3	0	63646.42	(0.10)		72012
	5/2 – 3/2	1 – 2	0	63885.69	(0.10)		72012
	5/2 – 3/2	4 – 3	0	63950.17	(0.10)		69003
	5/2 – 3/2	2 – 2	0	64096.78	(0.10)		69003
	5/2 – 3/2	1 – 1	0	64158.33	(0.10)		69003
	5/2 – 3/2	1 – 0	0	64230.18	(0.10)		69003
	5/2 – 3/2	2 – 1	0	64369.35	(0.10)		69003
	5/2 – 3/2	3 – 2	0	64379.23	(0.10)		69003
	5/2 – 3/2	4 – 3	1	63406.42	(0.10)		72012
	5/2 – 3/2	2 – 2	1	63553.92	(0.10)		72012
	5/2 – 3/2	1 – 1	1	63610.77	(0.10)		72012
	5/2 – 3/2	2 – 1	1	63819.03	(0.10)		72012
	5/2 – 3/2	3 – 2	1	63832.20	(0.10)		72012
$^{81}Br^{16}O$ $^2\Pi_{3/2}$	5/2 – 3/2	2 – 3	0	63045.55	(0.10)		72012
	5/2 – 3/2	3 – 3	0	63344.40	(0.10)		72012
	5/2 – 3/2	1 – 2	0	63585.75	(0.10)		72012
	5/2 – 3/2	4 – 3	0	63681.38	(0.10)		69003
	5/2 – 3/2	2 – 2	0	63804.18	(0.10)		69003
	5/2 – 3/2	1 – 1	0	63911.32	(0.10)		69003
	5/2 – 3/2	1 – 0	0	64019.95	(0.10)		69003
	5/2 – 3/2	3 – 2	0	64103.18	(0.10)		69003
	5/2 – 3/2	2 – 1	0	64129.53	(0.10)		69003
	5/2 – 3/2	4 – 3	1	63141.12	(0.10)		72012
	5/2 – 3/2	2 – 2	1	63264.86	(0.10)		72012
	5/2 – 3/2	3 – 2	1	63559.25	(0.10)		72012
	5/2 – 3/2	2 – 1	1	63582.32	(0.10)		72012

BrRb

Rubidium Bromide

	$^{85}Rb^{79}Br$	$^{85}Rb^{81}Br$		$^{87}Rb^{79}Br$	
	Value (Unc.)	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	1424.8523(12)	1406.6192(37)	1019	1409.080(15)	1019
Y_{11} [MHz]	-5.5760(12)	-5.4667(43)	1019	-5.4744(85)	65
Y_{21} [MHz]	0.00683(32)	0.0057(12)	1019		
Y_{02} [kHz]	-0.44833(16)	-0.43722(44)	1019	-0.43877(40)	1019
Y_{12} [Hz]	0.00(15)	-0.01(12)	1019		
μ_0 [D]	10.86(10)		68001		
μ_r [amu]	40.9027174	41.4329555		41.3606144	

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{85}Rb^{79}Br$	8 – 7		0	22752.29	(0.10)	65
	9 – 8		0	25596.03	(0.10)	65
	9 – 8		1	25495.98	(0.10)	65
	9 – 8		2	25396.14	(0.10)	65
	9 – 8		3	25296.52	(0.10)	65
	9 – 8		4	25197.32	(0.10)	65
	50 – 49		0	141982.40	(0.10)	1019
	51 – 50		0	144812.72	(0.10)	1019
	51 – 50		1	144245.34	(0.10)	1019
	55 – 54		0	156128.74	(0.10)	1019
	63 – 62		0	178731.66	(0.10)	1019
	64 – 63		1	180842.11	(0.10)	1019
	64 – 63		2	180131.87	(0.10)	1019
	69 – 68		0	195655.53	(0.10)	1019
	69 – 68		1	194887.95	(0.10)	1019
	69 – 68		2	194122.20	(0.10)	1019
$^{85}Rb^{81}Br$	9 – 8		0	25268.84	(0.10)	65
	9 – 8		1	25170.56	(0.10)	65
	9 – 8		2	25072.63	(0.10)	65
	51 – 50		0	142964.40	(0.10)	1019
	52 – 51		1	145190.94	(0.10)	1019
	52 – 51		2	144624.81	(0.10)	1019
	56 – 55		0	156928.04	(0.10)	1019
	64 – 63		0	179238.80	(0.10)	1019
	64 – 63		1	178540.49	(0.10)	1019
	70 – 69		0	195943.97	(0.10)	1019
	70 – 69		1	195180.19	(0.10)	1019
	70 – 69		2	194417.98	(0.10)	1019
$^{87}Rb^{79}Br$	9 – 8		0	25312.99	(0.10)	65
	9 – 8		1	25214.65	(0.10)	65
	9 – 8		2	25116.57	(0.10)	65
	64 – 63		0	179551.22	(0.10)	1019
	65 – 64		0	182342.01	(0.10)	1019
	69 – 68		0	193498.03	(0.10)	1019

BrTl

Thallium Bromide

	$^{205}Tl^{79}Br$	$^{205}Tl^{81}Br$	$^{203}Tl^{79}Br$	$^{203}Tl^{81}Br$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	1293.879(8)	1270.805(8)	1297.409(10)	1274.382(12)	530
Y_{11} [MHz]	-3.932(5)	-3.824(5)	-3.934(9)	-3.872(10)	530
Y_{21} [MHz]	0.0043(30)				530
Y_{02} [MHz]	-0.247				530[a]
$eq_0Q(Br)$ [MHz]	126.31088(10)	105.51634(20)	126.31096(20)	105.51650(20)	70004
$eq_1Q(Br)$ [MHz]	126.80831(20)	105.92826(20)	126.80875(25)	105.92873(25)	70004
$eq_2Q(Br)$ [MHz]	127.30261(20)	106.33752(20)	127.30364(25)	106.33839(25)	70004
$eq_3Q(Br)$ [MHz]	127.79358(30)	106.74419(30)	127.79520(25)	106.74605(30)	70004
$eq_4Q(Br)$ [MHz]	128.28182(X)	107.14806(X)			70004
$eq_eQ(Br)$ [MHz]	126.06099(30)	105.30938(30)	126.0697(30)		70004
c_{Tl} [kHz]	3.690(5)	3.915(5)	3.691(10)	3.909(10)	70004
c_{Br} [kHz]	42.74(5)	42.02(5)	42.55(8)	41.83(8)	70004
c_3 [kHz]	-1.65(5)		-1.55(8)	-1.68(8)	70004
c_4 [kHz]	-6.35(5)		-6.39(8)	-6.91(8)	70004
μ_0 [D]	4.493(50)				71007
μ_r [amu]	56.980108	58.014373	56.824295	57.852860	

[a]Calculated from the Kratzer relation.

Additional reference: 213

Isotopic Species	J′ ← J″	F′ F₁′ ← F″ F₁″	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{205}Tl^{79}Br$	3 – 2	9/2 – 7/2	0	7750.009	(0.01)	71007
	3 – 2	7/2 – 5/2	0	7750.009	(0.01)	71007
	3 – 2	5/2 – 3/2	0	7757.789	(0.02)	71007
	3 – 2	3/2 – 1/2	0	7757.789	(0.02)	71007
	4 – 3	11/2 – 9/2	0	10334.35	(0.03)	530
	4 – 3	9/2 – 7/2	0	10334.35	(0.03)	530
	4 – 3	7/2 – 5/2	0	10337.98	(0.03)	530
	4 – 3	5/2 – 3/2	0	10337.98	(0.03)	530
	4 – 3	11/2 – 9/2	1	10302.91	(0.03)	530
	4 – 3	9/2 – 7/2	1	10302.91	(0.03)	530
	4 – 3	7/2 – 5/2	1	10306.50	(0.03)	530
	4 – 3	5/2 – 3/2	1	10306.50	(0.03)	530
	4 – 3	11/2 – 9/2	2	10271.55	(0.03)	530
	4 – 3	9/2 – 7/2	2	10271.55	(0.03)	530
	4 – 3	7/2 – 5/2	2	10275.20	(0.03)	530
	4 – 3	5/2 – 3/2	2	10275.20	(0.03)	530
	4 – 3	11/2 – 9/2	3	10240.21	(0.03)	530

Isotopic Species	J' ← J''	F' F$_1$' ← F'' F$_1$''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{205}Tl^{79}Br$	4 – 3	9/2 – 7/2	3	10240.21	(0.03)	530
	4 – 3	7/2 – 5/2	3	10243.80	(0.03)	530
	4 – 3	5/2 – 3/2	3	10243.80	(0.03)	530
	4 – 3	11/2 – 9/2	4	10208.93	(0.03)	530
	4 – 3	9/2 – 7/2	4	10208.93	(0.03)	530
	4 – 3	7/2 – 5/2	4	10212.58	(0.04)	530
	4 – 3	5/2 – 3/2	4	10212.58	(0.04)	530
	6 – 5	15/2 – 13/2	0	15502.55	(0.10)	509
	6 – 5	9/2 – 7/2	0	15503.79	(0.20)	509
	9 – 8		0	23254.06	(0.05)	509
	9 – 8		1	23183.49	(0.10)	509
	9 – 8		2	23112.80	(0.10)	509
	9 – 8		3	23042.54	(0.10)	509
$^{205}Tl^{81}Br$	4 – 3	11/2 – 9/2	0	10150.36	(0.03)	530
	4 – 3	9/2 – 7/2	0	10150.36	(0.03)	530
	4 – 3	7/2 – 5/2	0	10153.41	(0.03)	530
	4 – 3	5/2 – 3/2	0	10153.41	(0.03)	530
	4 – 3	11/2 – 9/2	1	10119.78	(0.03)	530
	4 – 3	9/2 – 7/2	1	10119.78	(0.03)	530
	4 – 3	7/2 – 5/2	1	10122.81	(0.03)	530
	4 – 3	5/2 – 3/2	1	10122.81	(0.03)	530
	4 – 3	11/2 – 9/2	2	10089.30	(0.03)	530
	4 – 3	9/2 – 7/2	2	10089.30	(0.03)	530
	4 – 3	7/2 – 5/2	2	10092.38	(0.03)	530
	4 – 3	5/2 – 3/2	2	10092.38	(0.03)	530
	4 – 3	11/2 – 9/2	3	10058.68	(0.03)	530
	4 – 3	9/2 – 7/2	3	10058.68	(0.03)	530
	4 – 3	7/2 – 5/2	3	10061.70	(0.03)	530
	4 – 3	5/2 – 3/2	3	10061.70	(0.03)	530
	4 – 3	11/2 – 9/2	4	10028.30	(0.03)	530
	4 – 3	9/2 – 7/2	4	10028.30	(0.03)	530
	4 – 3	7/2 – 5/2	4	10031.36	(0.04)	530
	4 – 3	5/2 – 3/2	4	10031.36	(0.04)	530
	4 – 3	11/2 – 9/2	5	9998.00	(0.03)	530
	4 – 3	9/2 – 7/2	5	9998.00	(0.03)	530
	4 – 3	11/2 – 9/2	6	9967.35	(0.08)	530
	4 – 3	9/2 – 7/2	6	9967.35	(0.08)	530
	4 – 3	11/2 – 9/2	7	9937.15	(0.10)	530
	4 – 3	9/2 – 7/2	7	9937.15	(0.10)	530
	4 – 3	11/2 – 9/2	8	9906.80	(0.10)	530
	4 – 3	9/2 – 7/2	8	9906.80	(0.10)	530
	4 – 3	11/2 – 9/2	9	9876.60	(0.15)	530
	4 – 3	9/2 – 7/2	9	9876.60	(0.15)	530
	9 – 8		0	22839.75	(0.10)	509
	9 – 8		1	22771.22	(0.20)	509
	10 – 9		0	25377.53	(0.05)	509
$^{203}Tl^{79}Br$	4 – 3	11/2 – 9/2	0	10362.63	(0.03)	530
	4 – 3	9/2 – 7/2	0	10362.63	(0.03)	530
	4 – 3	7/2 – 5/2	0	10366.24	(0.04)	530
	4 – 3	5/2 – 3/2	0	10366.24	(0.04)	530
	4 – 3	11/2 – 9/2	1	10331.16	(0.04)	530
	4 – 3	9/2 – 7/2	1	10331.16	(0.04)	530
	9 – 8		0	23317.65	(0.10)	509
	9 – 8		1	23246.83	(0.20)	509
	9 – 8		2	23175.68	(0.20)	509
$^{203}Tl^{81}Br$	4 – 3	11/2 – 9/2	0	10178.87	(0.04)	530
	4 – 3	9/2 – 7/2	0	10178.87	(0.04)	530
	4 – 3	7/2 – 5/2	0	10181.86	(0.06)	530
	4 – 3	5/2 – 3/2	0	10181.86	(0.06)	530
	4 – 3	11/2 – 9/2	1	10147.89	(0.04)	530
	4 – 3	9/2 – 7/2	1	10147.89	(0.04)	530
	9 – 8		0	22903.48	(0.10)	509
	9 – 8		1	22834.13	(0.20)	509

CN

Cyano-Radical

$^{12}C^{14}N$		
Constant[a]	Value (Unc.)	Ref.
ν_0 [MHz]	113386.2(6)	74000
B_0 [MHz]	56693.1(3)	74000
γ [MHz]	217.1(5)	74000
b [MHz]	-32.9(10)	74000
c [MHz]	58.7(15)	74000
eqQ(^{14}N) [MHz]	-1.1(20)	74000

[a]The Hamiltonian used in the analysis of CN for Hund's case ($b_{\beta J}$) is:

$$\mathcal{H} = B_0\, N(N+1) + \gamma\, \vec{S}\cdot\vec{N} + b\, \vec{I}\cdot\vec{S} + c\, I_z S_z + eqQ\, f(I,J,F)$$

Spectral Line Table

Isotopic Species	J' , N' ← J'' , N''	$F_1' \leftarrow F_1''$	v	Frequency (Unc.)	Reference
$^{12}C^{14}N$	1/2 , 1 - 1/2 , 0	1/2 - 3/2	0	113145.0 (0.50)	74000
	1/2 , 1 - 1/2 , 0	3/2 - 1/2	0	113171.0 (0.50)	74000
	1/2 , 1 - 1/2 , 0	3/2 - 3/2	0	113191.0 (0.50)	74000
	3/2 , 1 - 1/2 , 0	3/2 - 1/2	0	113488.1 (0.30)	74000
	3/2 , 1 - 1/2 , 0	5/2 - 3/2	0	113490.9 (0.20)	74000
	3/2 , 1 - 1/2 , 0	1/2 - 1/2	0	113499.0 (0.50)	74000
	3/2 , 1 - 1/2 , 0	3/2 - 3/2	0	113508.0 (0.50)	74000

CO

Carbon Monoxide

Isotopic Species	μ_r[amu]	B_0[MHz]	D_0[kHz]	Ref.
$^{12}C^{16}O$	6.85620871(6)	57635.969(3)	183.57(7)	b
$^{13}C^{16}O$	7.17227491(14)	55101.021(12)	167.75(10)[a]	b
$^{12}C^{18}O$	7.19986559(14)	54891.424(12)	166.46(10)[a]	b
$^{14}C^{16}O$	7.46648088(14)	52935.865(12)	154.79(9)	b
$^{13}C^{18}O$	7.54937036(14)	52356.011(12)	151.41(9)	b
$^{12}C^{17}O$	7.03433435(70)	56179.983(25)	174.39(10)[a]	b

Other Molecular Constants

$\mu_0(^{12}C^{16}O)$ [D]	0.112(5)	[517]
$g_J(^{12}C^{16}O)$ [μ_n]	-0.26890(10)	[1685]
$g_J(^{13}C^{16}O)$ [μ_n]	-0.25691(20)	[68002]
$eq_0Q(^{12}C^{17}O)$ [MHz]	4.52(69)	[464,1466]
$c_0(^{12}C^{17}O)$ [kHz]	25(10)	[464,1466]

[a]Calculated from the value for $^{12}C^{16}O$ by isotopic relations.

[b]Refit to data in Refs. 70007, 572 and 464. See Ref. 73024.

Isotopic Species	J'	← J''	F'	F'₁ ← F''	F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{12}C^{16}O$	1	– 0				0	115271.204	(0.01)	572
	2	– 1				0	230537.974	(0.05)	409
	3	– 0				0	345795.989	(0.10)	70007
	4	– 3				0	461040.811	(0.10)	70007
	5	– 4				0	576267.934	(0.10)	70007
	6	– 5				0	691472.978	(0.10)	70007
	7	– 6				0	806651.719	(0.10)	70007
$^{13}C^{16}O$	1	– 0				0	110201.370	(0.01)	572
$^{12}C^{18}O$	1	– 0				0	109782.182	(0.01)	572
$^{14}C^{16}O$	1	– 0				0	105871.110	(0.01)	572
$^{13}C^{18}O$	1	– 0				0	104711.416	(0.01)	572
$^{12}C^{17}O$	1	– 0		3/2 –	5/2	0	112358.720	(0.10)	464
	1	– 0		7/2 –	5/2	0	112358.980	(0.02)	464
	1	– 0		5/2 –	5/2	0	112360.016	(0.02)	464

CS

Carbon Monosulfide

	$^{12}C^{32}S$		$^{12}C^{34}S$		$^{12}C^{33}S$		$^{13}C^{32}S$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.
B_0 [MHz]	24495.575(5)	a	24103.55(6)	c	24293.339(12)	219	23123.808(10)	219
D_0 [kHz]	40.237(250)	a	38.77(36)	c	39.57(25)	d	35.85(22)	d
H_0 [Hz]	0.062(6)	b						
$eq_0Q(^{33}S)$ [MHz]					12.835(33)	219		
c_S [kHz]					18.7(37)	219		
B_1 [MHz]	24318.037(5)	219						
μ_0 [D]	1.958(3)	68005						
μ_1 [D]	1.936(10)	68005						
g_J [μ_n]	±0.269(5)	68004						
μ_r [amu]	8.72519418		8.86737716		8.79796914		9.24380789	

[a]Weighted fit to data from Ref. 1100 and 219. If H_0 is included in fit the following values are obtained: B_0 = 24495.586(24) MHz, D_0 = 42.18(32) khz and H_0 = 50.6(270) Hz.

[b]Calculated from B_e, ω_e and a_1.

[c]Weighted fit to data from Ref. 1100 and 219. If H_0 is included in fit, the following values are obtained: B_0 = 24103.553 MHz, D_0 = 39.792 kHz and H_0 = 62.5 Hz.

[d]Calculated by isotope relations from $^{12}C^{32}S$.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{12}C^{32}S$	1 – 0		0	48991.000	(0.01)	219
	1 – 0		1	48635.912	(0.05)	219
	2 – 1		0	97981.007	(0.01)	1100
	3 – 2		0	146969.039	(0.05)	1100
	4 – 3		0	195954.162	(0.05)	1100
	5 – 4		0	244935.737	(0.05)	1100
$^{12}C^{34}S$	1 – 0		0	48206.948	(0.01)	219
	2 – 1		0	96412.953	(0.02)	1100
	3 – 2		0	144617.117	(0.01)	1100
$^{12}C^{33}S$	1 – 0	1/2 – 3/2	0	48583.264	(0.01)	219
	1 – 0	5/2 – 3/2	0	48585.906	(0.01)	219
	1 – 0	3/2 – 3/2	0	48589.068	(0.01)	219
$^{13}C^{32}S$	1 – 0		0	46247.472	(0.02)	219

CSe

Carbon Selenide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{02}[kHz]	B_0[MHz]	Ref.
$^{12}C^{80}Se$	10.4333611	17240.6(13)	-115.8(25)	-21.25(5)[a]	17182.77(2)	c
$^{12}C^{78}Se$	10.3985286	17298.4(13)	-116.3(25)	-21.39(5)[b]	17240.20(2)	c
$^{12}C^{77}Se$	10.3805652	17328.3(13)	-116.6(25)	-21.47(5)[b]	17270.00(2)	c
$^{12}C^{76}Se$	10.3621327	17359.1(13)	-117.0(25)	-21.54(3)[b]	17300.62(3)	c
$^{12}C^{74}Se$	10.3240707	17423.1(13)	-117.6(25)	-21.70(5)[b]	17364.35(2)	c
$^{12}C^{82}Se$	10.4667265	17185.7(13)	-115.2(25)	-21.11(3)[b]	17128.09(2)	c
$^{13}C^{80}Se$	11.1836450	16084.2(13)	-104.3(25)	-18.49(3)[b]	16032.00(6)	c
	DIPOLE MOMENT μ_0[D]	MAGNETIC CONSTANT $g_J[\mu_n]$				
$^{12}C^{80}Se$	1.99(4)	-0.2431(16)				73002

[a]Calculated from ω_e = 1036.0 cm^{-1} with $Y_{02} = -\frac{4Y_{01}^3}{\omega_e^2}$

[b]Calculated from isotope relations from $^{12}C^{80}Se$.

[c]Calculated with data from Ref. 73002 including non-adiabatic correction of the Born-Oppenheimer approximation.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{12}C^{74}Se$	1 – 0		0	34728.62	(0.04)	73002
$^{12}C^{76}Se$	1 – 0		0	34601.16	(0.06)	73002
$^{12}C^{77}Se$	1 – 0		0	34539.91	(0.04)	73002
$^{12}C^{78}Se$	1 – 0		0	34480.32	(0.04)	73002
$^{12}C^{80}Se$	1 – 0		0	34365.46	(0.03)	73002
$^{12}C^{82}Se$	1 – 0		0	34256.10	(0.04)	73002
$^{13}C^{80}Se$	1 – 0		0	32063.92	(0.12)	73002

ClCs

Cesium Chloride

	$^{133}Cs^{35}Cl$		$^{133}Cs^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	2161.2485(12)	73001	2068.8129(13)	73001
Y_{11} [MHz]	-10.11969(93)	73001	-9.4774(10)	a
Y_{21} [MHz]	0.01025(18)	73001	+0.00939(18)	a
Y_{31} [MHz]	53(10)	73001	43(10)	a
Y_{02} [kHz]	-0.97957(21)	73001	-0.89757(21)	a
Y_{12} [Hz]	-1.15(11)	73001	-1.03(11)	a
Y_{03} [10^{-3}Hz]	-0.141335(71)	73001	-0.123965(71)	a
Y_{04} [10^{-9}Hz]	-0.1821(54)	73001	-0.1529(54)	a
eq_0Q(Cs) [MHz]	≤ 1.1	72004		
eq_0Q(Cl) [MHz]	1.778(70)	72004	1.401(70)	b
eq_1Q(Cl) [MHz]	1.636(75)	72004	1.289(75)	b
eq_eQ(Cl) [MHz]	1.83(10)	72004		
μ_0 [D]	10.387(4)	68000		
μ_1 [D]	10.445(4)	68000		
μ_2 [D]	10.503(4)	68000		
μ_e [D]	10.358(5)	68000		
$\lvert g_J \rvert_{v=0}$ [μ_n]	0.02803(7)	73001		
μ_r [amu]	27.6847083		28.9217092	

[a] Calculated from isotope relations from ^{35}Cl values.

[b] Calculated from ratio eqQ(^{35}Cl)/eqQ(^{37}Cl) = 1.2688773(15).

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{133}Cs^{35}Cl$	2 – 1	1/2 – 3/2	0	8623.933	(0.03)	72004
	2 – 1	3/2 – 3/2	0	8624.360	(0.04)	72004
	2 – 1	7/2 – 5/2	0	8624.695	(0.03)	72004
	2 – 1	5/2 – 3/2	0	8624.695	(0.03)	72004
	2 – 1	1/2 – 1/2	0	8624.695	(0.03)	72004
	2 – 1	3/2 – 1/2	0	8625.158	(0.03)	72004
	2 – 1	5/2 – 5/2	0	8625.158	(0.03)	72004
	2 – 1	1/2 – 3/2	1	8583.603	(0.04)	72004
	2 – 1	7/2 – 5/2	1	8584.299	(0.03)	72004
	2 – 1	5/2 – 3/2	1	8584.299	(0.03)	72004
	2 – 1	1/2 – 1/2	1	8584.299	(0.03)	72004
	2 – 1	3/2 – 1/2	1	8584.730	(0.03)	72004
	2 – 1	5/2 – 5/2	1	8584.730	(0.03)	72004
	2 – 1	7/2 – 5/2	2	8543.984	(0.03)	72004
	2 – 1	5/2 – 3/2	2	8543.984	(0.03)	72004
	2 – 1	1/2 – 1/2	2	8543.984	(0.03)	72004
	2 – 1	3/2 – 1/2	2	8544.372	(0.03)	72004
	2 – 1	5/2 – 5/2	2	8544.372	(0.03)	72004
	2 – 1	7/2 – 5/2	3	8503.778	(0.03)	72004
	2 – 1	5/2 – 3/2	3	8503.778	(0.03)	72004
	2 – 1	1/2 – 1/2	3	8503.778	(0.03)	72004
	2 – 1	3/2 – 1/2	3	8504.142	(0.03)	72004
	2 – 1	5/2 – 5/2	3	8504.142	(0.03)	72004
	2 – 1	7/2 – 5/2	4	8463.622	(0.04)	72004
	2 – 1	5/2 – 3/2	4	8463.622	(0.04)	72004
	2 – 1	1/2 – 1/2	4	8463.622	(0.04)	72004
	2 – 1	3/2 – 1/2	4	8463.963	(0.04)	72004
	2 – 1	5/2 – 5/2	4	8463.963	(0.04)	72004
	2 – 1	7/2 – 5/2	5	8423.567	(0.04)	72004
	2 – 1	5/2 – 3/2	5	8423.567	(0.04)	72004
	2 – 1	1/2 – 1/2	5	8423.567	(0.04)	72004
	2 – 1	3/2 – 1/2	5	8423.896	(0.04)	72004
	2 – 1	5/2 – 5/2	5	8423.896	(0.04)	72004
	6 – 5		0	25873.445	(0.02)	73001
	6 – 5		1	25752.249	(0.02)	73001
	6 – 5		2	25631.324	(0.02)	73001
	6 – 5		3	25510.638	(0.02)	73001
	6 – 5		4	25390.219	(0.02)	73001
	6 – 5		5	25270.045	(0.02)	73001
	6 – 5		6	25150.180	(0.02)	73001
	6 – 5		7	25030.534	(0.02)	73001
	6 – 5		8	24911.195	(0.02)	73001
	6 – 5		9	24792.114	(0.02)	73001
	6 – 5		0	24673.367	(0.03)	73001
	6 – 5		1	24554.852	(0.03)	73001
	6 – 5		2	24436.566	(0.08)	73001
	6 – 5		3	24318.738	(0.10)	73001
	36 – 35		0	155062.73	(0.10)	1171
	45 – 44		0	193699.77	(0.10)	1171
	45 – 44		1	192790.44	(0.10)	1171
	45 – 44		2	191883.04	(0.10)	1171
	45 – 44		3	190977.56	(0.10)	1171
	54 – 53		0	232250.96	(0.10)	1171
	54 – 53		1	231159.53	(0.10)	1171
	54 – 53		2	230070.34	(0.10)	1171
	63 – 62		1	269425.24	(0.15)	1171
$^{133}Cs^{37}Cl$	6 – 5		0	24767.86	(0.30)	53003
	6 – 5		1	24654.26	(0.30)	53003
	6 – 5		2	24541.40	(0.50)	53003
	43 – 42		0	177224.90	(0.10)	1171
	43 – 42		1	176411.12	(0.10)	1171
	47 – 46		1	192760.59	(0.10)	1171
	60 – 59		0	246912.71	(0.10)	1171
	60 – 59		1	245776.61	(0.10)	1171

ClF

Chlorine Fluoride

		$^{35}Cl^{19}F$		$^{37}Cl^{19}F$	
Constant		Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01}	[MHz]	15483.646(40)	a	15183.203(40)	a
Y_{11}	[MHz]	-130.642(50)	a	-126.954(50)	a
Y_{02}	[kHz]	-26.3(5)	b		
eq_0Q (Cl)	[MHz]	-145.87211(9)	72020	-114.98(5)	259
eq_1Q (Cl)	[MHz]	-146.21(31)	c	-115.04(31)	d
c_{Cl}	[kHz]	+21.615(9)	72020	20(3)	259
c_F	[kHz]	-22.666(25)	72020		
c_3	[kHz]	+1.01(5)	72020		
c_4	[kHz]	+2.556	72020		
μ_0	[D]	0.8881(2)	72020		
g_J	[μ_n]	-0.1089(5)	72011	-0.1062(5)	72011
μ_r	[amu]	12.3102869		12.5489479	

[a]Calculated with data from Ref. 259 and Ref. 49000.

[b]Calculated using $Y_{02} = -\frac{4Y_{01}^3}{\omega_e^2}$ and $\omega_e = 793.2\ cm^{-1}$ [A. L. Wahrhaftig, J. Chem. Phys. 10, 248 (1942)].

[c]Calculated with data of Ref. 49000 using c_{Cl} = 21.615 kHz for v=1.

[d]Calculated with data from Ref. 49000 using c_{Cl} = 17.99(2) kHz for v=1.

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{35}Cl^{19}F$	1 – 0	3/2 – 3/2	0	30807.366	(0.01)	259
	1 – 0	5/2 – 3/2	0	30843.875	(0.01)	259
	1 – 0	1/2 – 3/2	0	30872.963	(0.01)	259
	1 – 0	3/2 – 3/2	1	30545.994	(0.07)	49000
	1 – 0	5/2 – 3/2	1	30582.614	(0.07)	49000
	1 – 0	1/2 – 3/2	1	30611.761	(0.07)	49000
$^{37}Cl^{19}F$	1 – 0	3/2 – 3/2	0	30228.344	(0.01)	259
	1 – 0	5/2 – 3/2	0	30257.135	(0.01)	259
	1 – 0	1/2 – 3/2	0	30280.056	(0.01)	259
	1 – 0	3/2 – 3/2	1	29974.470	(0.07)	49000
	1 – 0	5/2 – 3/2	1	30003.218	(0.07)	49000
	1 – 0	1/2 – 3/2	1	30026.195	(0.07)	49000

ClGa

Gallium Monochloride

	$^{69}Ga^{35}Cl$	$^{71}Ga^{35}Cl$	$^{69}Ga^{37}Cl$	$^{71}Ga^{37}Cl$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	4494.024(9)	4451.387(10)	4332.966(13)	4290.318(13)	72005
Y_{11} [MHz]	-23.789(12)	-23.443(16)	-22.523(16)	-22.177(10)	72005
Y_{21} [MHz]	0.0542(50)	0.052(7)			72005
Y_{02} [kHz]	-3.03[a]				72005
$eq_0Q(Ga)$ [MHz]	-92.10(14)	-57.97(10)	-92.00(16)	-58.03(10)	72005
$eq_1Q(Ga)$ [MHz]	-91.35(14)	-57.61(10)	-91.34(16)	-57.65(10)	72005
$eq_2Q(Ga)$ [MHz]	-90.77(14)	-57.22(10)			72005
$eq_3Q(Ga)$ [MHz]	-90.01(14)				72005
$eq_eQ(Ga)$ [MHz]	-92.40(15)	-58.19(12)	-92.40(15)	-58.19(12)	72005
$eq_0Q(Cl)$ [MHz]	-13.30(13)	-13.34(13)	-10.54(10)	-10.54(10)	72005
$eq_1Q(Cl)$ [MHz]	-13.48(13)	-13.41(15)	-10.63(12)	-10.77(12)	72005
$eq_2Q(Cl)$ [MHz]	-13.70(16)	-13.75(16)			72005
$eq_3Q(Cl)$ [MHz]	-13.89(20)				72005
$eq_eQ(Cl)$ [MHz]	-13.20(14)	-13.20(14)	-10.47(11)	-10.47(11)	72005
c_{Ga} [kHz]	13(7)	9(7)	10(7)	10(7)	72005
μ_r [amu]	23.1990149	23.4212133	24.0613903	24.3005004	

[a]Calculated from $-4\,Y_{01}{}^3/\omega_e$ = 365.0 cm^{-1} [E. Miescher and M. Wehrli, Helv. Phys. Acta 7, 331 (1934)].

Additional reference: 318.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{69}Ga^{35}Cl$	1 – 0	0 , 3/2 – 1 , 3/2	0	8943.211	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	0	8945.202	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	0	8945.202	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	0	8947.366	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	0	8947.366	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	0	8947.366	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	0	8967.569	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	0	8967.569	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	0	8968.443	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	0	8968.443	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	0	8968.443	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	0	8969.581	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	0	8970.903	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	0	8970.903	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	0	8970.903	(0.03)	72005
	1 – 0	1 , 1/2 – 2 , 3/2	0	8987.379	(0.03)	72005

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{69}Ga^{35}Cl$	1 – 0	1 , 1/2 – 1 , 3/2	0	8987.379	(0.03)	72005
	1 – 0	1 , 1/2 – 0 , 3/2	0	8987.379	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	0	8987.596	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	0	8987.596	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	0	8987.596	(0.03)	72005
	1 – 0	0 , 3/2 – 1 , 3/2	1	8895.949	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	1	8897.972	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	1	8897.972	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	1	8900.179	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	1	8900.179	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	1	8900.179	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	1	8920.158	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	1	8920.158	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	1	8921.050	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	1	8921.050	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	1	8921.050	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	1	8922.194	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	1	8923.526	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	1	8923.526	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	1	8923.526	(0.03)	72005
	1 – 0	1 , 1/2 – 2 , 3/2	1	8939.842	(0.03)	72005
	1 – 0	1 , 1/2 – 1 , 3/2	1	8939.842	(0.03)	72005
	1 – 0	1 , 1/2 – 0 , 3/2	1	8939.842	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	1	8940.034	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	1	8940.034	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	1	8940.034	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	2	8850.925	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	2	8850.925	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	2	8853.155	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	2	8853.155	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	2	8853.155	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	2	8872.946	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	2	8872.946	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	2	8873.835	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	2	8873.835	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	2	8873.835	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	2	8875.036	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	2	8876.370	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	2	8876.370	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	2	8876.370	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	2	8892.781	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	2	8892.781	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	2	8892.781	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	3	8804.138	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	3	8804.138	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	3	8806.390	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	3	8806.390	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	3	8806.390	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	3	8825.980	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	3	8825.980	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	3	8826.883	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	3	8826.883	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	3	8826.883	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	3	8828.062	(0.03)	72005
	1 – 0	1 , 1/2 – 2 , 3/2	3	8845.414	(0.03)	72005
	1 – 0	1 , 1/2 – 1 , 3/2	3	8845.414	(0.03)	72005
	1 – 0	1 , 1/2 – 0 , 3/2	3	8845.414	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	3	8845.660	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	3	8845.660	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	3	8845.660	(0.03)	72005
	2 – 1	4 , 5/2 – 4 , 5/2	0	17906.92	(0.20)	509
	2 – 1	3 , 5/2 – 2 , 3/2	0	17928.55	(0.20)	509
	2 – 1	5 , 7/2 – 4 , 5/2	0	17930.57	(0.20)	509
	2 – 1	3 , 3/2 – 3 , 3/2	0	17946.83	(1.00)	509
	2 – 1	5 , 7/2 – 4 , 5/2	1	17837.00	(0.50)	509
	2 – 1	5 , 7/2 – 4 , 5/2	2	17743.96	(0.50)	509
	2 – 1	5 , 7/2 – 4 , 5/2	3	17650.97	(0.50)	509
$^{71}Ga^{35}Cl$	1 – 0	0 , 3/2 – 1 , 3/2	0	8865.071	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	0	8867.030	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	0	8867.030	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	0	8869.180	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	0	8869.180	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	0	8869.180	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	0	8880.991	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	0	8880.991	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	0	8881.695	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	0	8881.695	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	0	8881.695	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	0	8882.939	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	0	8884.317	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	0	8884.317	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	0	8884.317	(0.03)	72005
	1 – 0	1 , 1/2 – 2 , 3/2	0	8893.962	(0.03)	72005

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{71}Ga^{35}Cl$	1 – 0	1 , 1/2 – 1 , 3/2	0	8893.962	(0.03)	72005
	1 – 0	1 , 1/2 – 0 , 3/2	0	8893.962	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	0	8894.291	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	0	8894.291	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	0	8894.291	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	1	8820.410	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	1	8820.410	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	1	8822.588	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	1	8822.588	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	1	8822.588	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	1	8834.285	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	1	8834.285	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	1	8834.985	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	1	8834.985	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	1	8834.985	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	1	8836.245	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	1	8837.619	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	1	8837.619	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	1	8837.619	(0.03)	72005
	1 – 0	1 , 1/2 – 2 , 3/2	1	8847.189	(0.03)	72005
	1 – 0	1 , 1/2 – 1 , 3/2	1	8847.189	(0.03)	72005
	1 – 0	1 , 1/2 – 0 , 3/2	1	8847.189	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	1	8847.551	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	1	8847.551	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	1	8847.551	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	2	8773.990	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	2	8773.990	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	2	8776.222	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	2	8776.222	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	2	8776.222	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	2	8787.785	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	2	8787.785	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	2	8788.473	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	2	8788.473	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	2	8788.473	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	2	8789.750	(0.03)	72005
	1 – 0	1 , 1/2 – 2 , 3/2	2	8800.646	(0.03)	72005
	1 – 0	1 , 1/2 – 1 , 3/2	2	8800.646	(0.03)	72005
	1 – 0	1 , 1/2 – 0 , 3/2	2	8800.646	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	2	8800.994	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	2	8800.994	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	2	8800.994	(0.03)	72005
	2 – 1	5 , 7/2 – 4 , 5/2	0	17759.09	(0.50)	509
	2 – 1	5 , 7/2 – 4 , 5/2	1	17666.88	(0.50)	509
	2 – 1	5 , 7/2 – 4 , 5/2	2	17573.70	(0.50)	509
$^{69}Ga^{37}Cl$	1 – 0	3 , 3/2 – 3 , 3/2	0	8624.531	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	0	8624.531	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	0	8626.239	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	0	8626.239	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	0	8626.239	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	0	8646.952	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	0	8646.952	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	0	8647.725	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	0	8647.725	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	0	8647.725	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	0	8648.565	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	0	8649.603	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	0	8649.603	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	0	8649.603	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	0	8666.612	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	0	8666.612	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	0	8666.612	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	1	8579.825	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	1	8579.825	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	1	8581.513	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	1	8581.513	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	1	8581.513	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	1	8602.060	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	1	8602.060	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	1	8602.835	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	1	8602.835	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	1	8602.835	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	1	8603.715	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	1	8621.594	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	1	8621.594	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	1	8621.594	(0.03)	72005
	2 – 1	5 , 7/2 – 4 , 5/2	0	17289.15	(0.50)	509
$^{71}Ga^{37}Cl$	1 – 0	3 , 3/2 – 3 , 3/2	0	8546.335	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	0	8546.335	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	0	8548.008	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	0	8548.008	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	0	8548.008	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	0	8560.345	(0.03)	72005

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{71}Ga^{37}Cl$	1 – 0	3 , 5/2 – 2 , 3/2	0	8560.345	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	0	8561.000	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	0	8561.000	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	0	8561.000	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	0	8561.913	(0.03)	72005
	1 – 0	1 , 5/2 – 2 , 3/2	0	8563.015	(0.03)	72005
	1 – 0	1 , 5/2 – 1 , 3/2	0	8563.015	(0.03)	72005
	1 – 0	1 , 5/2 – 0 , 3/2	0	8563.015	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	0	8573.250	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	0	8573.250	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	0	8573.250	(0.03)	72005
	1 – 0	3 , 3/2 – 3 , 3/2	1	8502.230	(0.03)	72005
	1 – 0	3 , 3/2 – 2 , 3/2	1	8502.230	(0.03)	72005
	1 – 0	2 , 3/2 – 3 , 3/2	1	8503.963	(0.03)	72005
	1 – 0	2 , 3/2 – 2 , 3/2	1	8503.963	(0.03)	72005
	1 – 0	2 , 3/2 – 1 , 3/2	1	8503.963	(0.03)	72005
	1 – 0	3 , 5/2 – 3 , 3/2	1	8516.151	(0.03)	72005
	1 – 0	3 , 5/2 – 2 , 3/2	1	8516.151	(0.03)	72005
	1 – 0	2 , 5/2 – 3 , 3/2	1	8516.804	(0.03)	72005
	1 – 0	2 , 5/2 – 2 , 3/2	1	8516.804	(0.03)	72005
	1 – 0	2 , 5/2 – 1 , 3/2	1	8516.804	(0.03)	72005
	1 – 0	4 , 5/2 – 3 , 3/2	1	8517.752	(0.03)	72005
	1 – 0	2 , 1/2 – 3 , 3/2	1	8529.021	(0.03)	72005
	1 – 0	2 , 1/2 – 2 , 3/2	1	8529.021	(0.03)	72005
	1 – 0	2 , 1/2 – 1 , 3/2	1	8529.021	(0.03)	72005
	2 – 1	5 , 7/2 – 4 , 5/2	0	17118.24	(0.50)	509

ClH

Hydrogen Chloride

	$H^{35}Cl$		$^{2}H^{35}Cl$		$^{3}H^{35}Cl$		$^{3}H^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	317582.62(100)	65004	163350.8(50)	62001	112296(300)	56003	111601(300)	56003
Y_{11} [MHz]	-9209.05(100)	65004	-3396.4(10)	62001	-1832(80)	56003	-1964(80)	56003
Y_{21} [MHz]	53.14(100)	65004	13.76(50)	62001				
Y_{31} [MHz]	-3.60(40)	65004	-0.63(8)	62001				
Y_{02} [MHz]	-15.947(10)	65004			-2.31(50)	56003	-2.02(50)	56002
Y_{12} [MHz]	0.225(5)	65004			0.25(5)	56003	0.34(5)	56002
Y_{22} [MHz]	-0.012(2)	65004						
Y_{03} [kHz]	0.522(50)	65004						
Y_{13} [Hz]	-19.0	65004						
Y_{04} [kHz]	-2.98×10^{-5}	65004						
Y_{05} [kHz]	1.2×10^{-9}	65004						
$eq_0Q(H_{J=1})$ [MHz]			0.18736(30)	70010				
$eq_0Q(H_{J=2})$ [MHz]			0.1870(28)	70010				
$eq_1Q(H_{J=1})$ [MHz]			0.1848(38)	70010				
$eq_0Q(Cl_{J=1})$ [MHz]	-67.61881(15)	73004	-67.39338(9)	70010				
$eq_0Q(Cl_{J=2})$ [MHz]	-67.63853(15)	70010	-67.40332(29)	70010				
$eq_0Q(Cl_{J=3})$ [MHz]			-67.41800(10)	70010				
$eq_1Q(Cl_{J=1})$ [MHz]	-69.27289(93)	70010	-68.5831(10)	70010				
$eq_2Q(Cl_{J=1})$ [MHz]	-70.9081(24)	70010						
$eq_eQ(Cl)$ [MHz]	-66.7751(30)	70010						
$c_H(v=0)$[kHz]	-41.70(8)	73004	-3.295(46)	70010				
$c_H(v=1)$[kHz]	-41.09(24)	70010						
$c_H(v=2)$[kHz]	-39.94(94)	70010						
$c_{Cl}(v=0)$[kHz]	53.841(18)	73004	27.426(7)	70010				
$c_{Cl}(v=1)$[kHz]	58.597(45)	70010	29.121(62)	70010				
$c_{Cl}(v=2)$[kHz]	63.68(17)	70010						
c_3 [kHz]	5.59(6)	73004						
c_4 [kHz]	0.02(6)	73004						
g_J [μ_n]	0.45935(9)	73004						
μ_0 [D]	1.1086(3)	73004	1.1033(5)	70010				
μ_1 [D]	1.1390(10)	70010	1.1256(10)	70010				
μ_2 [D]	1.1685(10)	70010						
μ_e [D]	1.0929(6)	70010						

Isotopic Species	μ_r [amu]	B_0 [MHz]	D_0 [MHz]	Ref.
$^{1}H^{35}Cl$	0.97959272	312989.297(20)	15.836[a]	71002
$^{1}H^{37}Cl$	0.98107747	312519.121(20)	15.788[a]	71002
$^{2}H^{35}Cl$	1.90441364	161656.238(14)	4.196(3)	71002
$^{2}H^{37}Cl$	1.91003328	161183.122(16)	4.162(3)	71002
$^{3}H^{35}Cl$	2.77657153	111075.84[b]	1.977[a]	71002
$^{3}H^{37}Cl$	2.78853317	110601.62[b]	1.960[a]	71002

[a]Value taken from Reference 62001.

[b]Derived from data in Reference 166.

Additional references: 520, 604, 1195, 1195a, 1334, 62001, 56002.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{1}H^{35}Cl$	1 – 0	3/2 – 3/2	0	625901.603	(0.10)	71002
	1 – 0	5/2 – 3/2	0	625918.756	(0.10)	71002
	1 – 0	1/2 – 3/2	0	625932.007	(0.10)	71002
$^{1}H^{37}Cl$	1 – 0	3/2 – 3/2	0	624964.374	(0.10)	71002
	1 – 0	5/2 – 3/2	0	624977.821	(0.10)	71002
	1 – 0	1/2 – 3/2	0	624988.334	(0.10)	71002
$^{2}H^{35}Cl$	1 – 0	3/2 – 3/2	0	323282.174	(0.10)	71002
	1 – 0	5/2 – 3/2	0	323299.109	(0.10)	71002
	1 – 0	1/2 – 3/2	0	323312.481	(0.10)	71002
	2 – 1	5/2 – 5/2	0	646475.310	(0.20)	71002
	2 – 1	7/2 – 5/2	0	646492.055	(0.20)	71002
	2 – 1	3/2 – 3/2	0	646504.084	(0.10)	71002
$^{2}H^{37}Cl$	1 – 0	3/2 – 3/2	0	322338.946	(0.10)	71002
	1 – 0	5/2 – 3/2	0	322352.301	(0.10)	71002
	1 – 0	1/2 – 3/2	0	322362.797	(0.10)	71002
	2 – 1	5/2 – 5/2	0	644587.224	(0.20)	71002
	2 – 1	7/2 – 5/2	0	644600.362	(0.20)	71002
	2 – 1	3/2 – 3/2	0	644609.927	(0.10)	71002
$^{3}H^{35}Cl$	1 – 0	3/2 – 3/2	0	222130.32	(2.00)	166
	1 – 0	5/2 – 3/2	0	222147.23	(2.00)	166
	1 – 0	1/2 – 3/2	0	222160.50	(2.00)	166
$^{3}H^{37}Cl$	1 – 0	3/2 – 3/2	0	221184.82	(2.00)	166
	1 – 0	5/2 – 3/2	0	221198.00	(2.00)	166
	1 – 0	1/2 – 3/2	0	221208.69	(2.00)	166

CII

Iodine Monochloride

	$^{127}I^{35}Cl$		$^{127}I^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
B_0 [MHz]	3414.366(4)	72017	3269.924(5)	72017
B_1 [MHz]	3398.315(5)	72017	3254.90(1)	72017
Y_{01} [MHz]	3422.392(15)	72017	3277.436(20)	72017
Y_{11} [MHz]	-16.051(15)	72017	-15.024(20)	72017
$eq_0Q(I)$ [MHz]	-2927.87(11)	72017	-2927.87(15)	72017
$eq_1Q(I)$ [MHz]	-2925.79(17)	72017	-2925.6(7)	72017
$eq_0Q(Cl)$ [MHz]	-85.84(15)	72017	-67.66(19)	72017
$eq_1Q(Cl)$ [MHz]	-86.08(22)	72017	-68.2(8)	72017
c_I [kHz]	19(6)	72017	16(7)	72017
μ_0 [D]	1.24(2)	72017		
μ_r [amu]	27.4146708		28.6271294	

Additional References: 48000, 1283

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{127}I^{35}Cl$	1 – 0	7/2 – 5/2	0	6980.	(5.00)	47000
	2 – 1	1 , 5/2 – 0 , 3/2	0	13042.80	(0.02)	72017
	2 – 1	1 , 5/2 – 1 , 3/2	0	13046.00	(0.02)	72017
	2 – 1	4 , 5/2 – 3 , 3/2	0	13048.88	(0.02)	72017
	2 – 1	2 , 5/2 – 1 , 3/2	0	13052.64	(0.02)	72017
	2 – 1	3 , 5/2 – 3 , 3/2	0	13054.88	(0.02)	72017
	2 – 1	2 , 5/2 – 2 , 3/2	0	13055.44	(0.02)	72017
	2 – 1	3 , 5/2 – 2 , 3/2	0	13058.56	(0.02)	72017
	2 – 1	2 , 7/2 – 2 , 7/2	0	13150.88	(0.02)	72017
	2 – 1	5 , 7/2 – 5 , 7/2	0	13154.95	(0.02)	72017
	2 – 1	4 , 7/2 – 3 , 7/2	0	13159.96	(0.02)	72017
	2 – 1	3 , 7/2 – 3 , 7/2	0	13160.97	(0.02)	72017
	2 – 1	4 , 7/2 – 4 , 7/2	0	13163.78	(0.02)	72017
	2 – 1	3 , 7/2 – 4 , 7/2	0	13164.72	(0.02)	72017
	2 – 1	4 , 5/2 – 5 , 7/2	0	13315.84	(0.02)	72017
	2 – 1	2 , 5/2 – 3 , 7/2	0	13326.79	(0.02)	72017
	2 – 1	3 , 5/2 – 4 , 7/2	0	13333.55	(0.02)	72017
	2 – 1	0 , 3/2 – 1 , 3/2	0	13441.20	(0.02)	72017
	2 – 1	1 , 3/2 – 0 , 3/2	0	13450.32	(0.02)	72017
	2 – 1	3 , 3/2 – 3 , 3/2	0	13452.88	(0.02)	72017
	2 – 1	3 , 3/2 – 2 , 3/2	0	13456.40	(0.02)	72017
	2 – 1	1 , 3/2 – 2 , 3/2	0	13456.40	(0.02)	72017
	2 – 1	2 , 3/2 – 3 , 3/2	0	13465.04	(0.02)	72017
	2 – 1	2 , 3/2 – 1 , 3/2	0	13465.96	(0.02)	72017
	2 – 1	2 , 3/2 – 2 , 3/2	0	13468.80	(0.02)	72017
	2 – 1	5 , 9/2 – 5 , 7/2	0	13708.80	(0.02)	72017
	2 – 1	5 , 9/2 – 4 , 7/2	0	13720.60	(0.02)	72017
	2 – 1	4 , 9/2 – 3 , 7/2	0	13721.92	(0.02)	72017
	2 – 1	6 , 9/2 – 5 , 7/2	0	13724.88	(0.02)	72017
	2 – 1	3 , 9/2 – 2 , 7/2	0	13725.60	(0.02)	72017
	2 – 1	3 , 9/2 – 3 , 7/2	0	13738.32	(0.02)	72017
	2 – 1	4 , 7/2 – 3 , 5/2	0	13757.96	(0.02)	72017
	2 – 1	3 , 7/2 – 3 , 5/2	0	13758.96	(0.02)	72017
	2 – 1	3 , 7/2 – 2 , 5/2	0	13768.20	(0.02)	72017
	2 – 1	2 , 7/2 – 2 , 5/2	0	13770.80	(0.02)	72017
	2 – 1	4 , 7/2 – 4 , 5/2	0	13774.04	(0.02)	72017
	2 – 1	5 , 7/2 – 4 , 5/2	0	13777.04	(0.02)	72017
	2 – 1	2 , 7/2 – 1 , 5/2	0	13786.56	(0.02)	72017
	2 – 1	1 , 1/2 – 0 , 3/2	0	13830.58	(0.02)	72017
	2 – 1	2 , 1/2 – 3 , 3/2	0	13832.92	(0.02)	72017
	2 – 1	1 , 1/2 – 2 , 3/2	0	13836.55	(0.02)	72017
	2 – 1	2 , 1/2 – 2 , 3/2	0	13836.55	(0.02)	72017
	2 – 1	4 , 5/2 – 3 , 5/2	0	13921.80	(0.02)	72017
	2 – 1	2 , 5/2 – 3 , 5/2	0	13924.68	(0.02)	72017
	2 – 1	3 , 5/2 – 3 , 5/2	0	13927.80	(0.02)	72017
	2 – 1	2 , 5/2 – 2 , 5/2	0	13933.94	(0.02)	72017
	2 – 1	3 , 5/2 – 2 , 5/2	0	13937.10	(0.02)	72017
	2 – 1	4 , 5/2 – 4 , 5/2	0	13937.92	(0.02)	72017
	2 – 1	1 , 5/2 – 1 , 5/2	0	13943.06	(0.02)	72017
	2 – 1	3 , 5/2 – 4 , 5/2	0	13943.94	(0.02)	72017
	2 – 1	2 , 5/2 – 1 , 5/2	0	13949.70	(0.02)	72017
	2 – 1	3 , 3/2 – 3 , 5/2	0	14325.78	(0.02)	72017
	2 – 1	2 , 3/2 – 3 , 5/2	0	14338.04	(0.02)	72017
	2 – 1	3 , 3/2 – 4 , 5/2	0	14341.94	(0.02)	72017
	2 – 1	2 , 3/2 – 2 , 5/2	0	14347.32	(0.02)	72017
	2 – 1	1 , 3/2 – 1 , 5/2	0	14350.54	(0.02)	72017
	2 – 1	4 , 5/2 – 3 , 3/2	1	12985.20	(0.02)	72017
	2 – 1	3 , 5/2 – 2 , 3/2	1	12994.92	(0.02)	72017
	2 – 1	2 , 7/2 – 2 , 7/2	1	13086.88	(0.02)	72017
	2 – 1	5 , 7/2 – 5 , 7/2	1	13091.08	(0.02)	72017
	2 – 1	3 , 7/2 – 3 , 7/2	1	13097.20	(0.02)	72017
	2 – 1	4 , 7/2 – 4 , 7/2	1	13099.94	(0.02)	72017
	2 – 1	4 , 5/2 – 5 , 7/2	1	13252.05	(0.02)	72017
	2 – 1	0 , 3/2 – 1 , 3/2	1	13377.06	(0.02)	72017
	2 – 1	3 , 3/2 – 3 , 3/2	1	13388.76	(0.02)	72017
	2 – 1	3 , 3/2 – 2 , 3/2	1	13392.38	(0.02)	72017
	2 – 1	2 , 3/2 – 3 , 3/2	1	13401.03	(0.02)	72017
	2 – 1	2 , 3/2 – 1 , 3/2	1	13401.92	(0.02)	72017
	2 – 1	2 , 3/2 – 2 , 3/2	1	13404.66	(0.02)	72017
	2 – 1	5 , 9/2 – 5 , 7/2	1	13644.57	(0.02)	72017
	2 – 1	5 , 9/2 – 4 , 7/2	1	13656.36	(0.02)	72017
	2 – 1	4 , 9/2 – 3 , 7/2	1	13657.62	(0.02)	72017
	2 – 1	6 , 9/2 – 5 , 7/2	1	13660.68	(0.02)	72017
	2 – 1	3 , 9/2 – 2 , 7/2	1	13661.35	(0.02)	72017
	2 – 1	4 , 7/2 – 3 , 5/2	1	13693.67	(0.02)	72017
	2 – 1	3 , 7/2 – 2 , 5/2	1	13703.92	(0.02)	72017
	2 – 1	5 , 7/2 – 4 , 5/2	1	13712.80	(0.02)	72017
	2 – 1	4 , 5/2 – 3 , 5/2	1	13857.50	(0.02)	72017
	2 – 1	2 , 5/2 – 3 , 5/2	1	13860.33	(0.02)	72017
	2 – 1	3 , 5/2 – 3 , 5/2	1	13863.41	(0.02)	72017
	2 – 1	2 , 5/2 – 2 , 5/2	1	13869.62	(0.02)	72017
	2 – 1	4 , 5/2 – 4 , 5/2	1	13873.66	(0.02)	72017
	2 – 1	1 , 5/2 – 1 , 5/2	1	13878.78	(0.02)	72017
	2 – 1	3 , 5/2 – 4 , 5/2	1	13879.68	(0.02)	72017

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{127}I^{35}Cl$	2 – 1	3 , 3/2 – 4 , 5/2	1	14277.33	(0.02)	72017
	4 – 3	3 , 5/2 – 2 , 3/2	0	27194.75	(0.20)	48001
	4 – 3	2 , 5/2 – 1 , 3/2	0	27202.64	(0.20)	48001
	4 – 3	4 , 5/2 – 3 , 3/2	0	27204.99	(0.20)	48001
	4 – 3	4 , 7/2 – 3 , 5/2	0	27217.51	(0.20)	48001
	4 – 3	3 , 7/2 – 2 , 5/2	0	27221.02	(0.20)	48001
	4 – 3	5 , 7/2 – 4 , 5/2	0	27225.32	(0.20)	48001
	4 – 3	2 , 7/2 – 1 , 5/2	0	27228.34	(0.20)	48001
	4 – 3	2 , 3/2 – 1 , 1/2	0	27242.59	(0.20)	48001
	4 – 3	3 , 3/2 – 2 , 1/2	0	27254.90	(0.20)	48001
	4 – 3	9/2 – 9/2	0	27283.66	(0.20)	48001
	4 – 3	9/2 – 9/2	0	27286.25	(0.20)	48001
	4 – 3	9/2 – 9/2	0	27292.63	(0.20)	48001
	4 – 3	9/2 – 9/2	0	27295.05	(0.20)	48001
	4 – 3	6 , 11/2 – 5 , 9/2	0	27333.85	(0.20)	48001
	4 – 3	6 , 13/2 – 5 , 11/2	0	27336.68	(0.20)	48001
	4 – 3	7 , 13/2 – 6 , 11/2	0	27336.68	(0.20)	48001
	4 – 3	5 , 13/2 – 4 , 11/2	0	27337.38	(0.20)	48001
	4 – 3	8 , 13/2 – 7 , 11/2	0	27337.38	(0.20)	48001
	4 – 3	4 , 11/2 – 3 , 9/2	0	27346.31	(0.20)	48001
	4 – 3	5 , 11/2 – 4 , 9/2	0	27354.71	(0.20)	48001
	4 – 3	7 , 11/2 – 6 , 9/2	0	27356.58	(0.20)	48001
	4 – 3	6 , 11/2 – 5 , 9/2	0	27357.73	(0.20)	48001
	4 – 3	13/2 – 11/2	1	27208.54	(0.20)	48001
$^{127}I^{37}Cl$	1 – 0	7/2 – 5/2	0	6684.	(5.00)	47000
	2 – 1	4 , 5/2 – 3 , 3/2	0	12472.58	(0.02)	72017
	2 – 1	2 , 5/2 – 1 , 3/2	0	12475.35	(0.02)	72017
	2 – 1	3 , 5/2 – 2 , 3/2	0	12480.12	(0.02)	72017
	2 – 1	2 , 7/2 – 2 , 7/2	0	12574.85	(0.02)	72017
	2 – 1	5 , 7/2 – 5 , 7/2	0	12578.08	(0.02)	72017
	2 – 1	3 , 7/2 – 3 , 7/2	0	12582.80	(0.02)	72017
	2 – 1	4 , 7/2 – 4 , 7/2	0	12585.10	(0.02)	72017
	2 – 1	4 , 5/2 – 5 , 7/2	0	12740.21	(0.02)	72017
	2 – 1	3 , 5/2 – 4 , 7/2	0	12754.25	(0.02)	72017
	2 – 1	0 , 3/2 – 1 , 3/2	0	12866.96	(0.02)	72017
	2 – 1	1 , 3/2 – 0 , 3/2	0	12874.13	(0.02)	72017
	2 – 1	3 , 3/2 – 3 , 3/2	0	12876.26	(0.02)	72017
	2 – 1	1 , 3/2 – 2 , 3/2	0	12878.98	(0.02)	72017
	2 – 1	3 , 3/2 – 2 , 3/2	0	12878.98	(0.02)	72017
	2 – 1	2 , 3/2 – 3 , 3/2	0	12885.88	(0.02)	72017
	2 – 1	2 , 3/2 – 1 , 3/2	0	12886.44	(0.02)	72017
	2 – 1	2 , 3/2 – 2 , 3/2	0	12888.71	(0.02)	72017
	2 – 1	5 , 9/2 – 5 , 7/2	0	13134.22	(0.02)	72017
	2 – 1	5 , 9/2 – 4 , 7/2	0	13143.42	(0.02)	72017
	2 – 1	4 , 9/2 – 3 , 7/2	0	13144.32	(0.02)	72017
	2 – 1	6 , 9/2 – 5 , 7/2	0	13146.85	(0.02)	72017
	2 – 1	3 , 9/2 – 2 , 7/2	0	13147.31	(0.02)	72017
	2 – 1	4 , 7/2 – 3 , 5/2	0	13183.01	(0.02)	72017
	2 – 1	3 , 7/2 – 3 , 5/2	0	13183.78	(0.02)	72017
	2 – 1	3 , 7/2 – 2 , 5/2	0	13191.09	(0.02)	72017
	2 – 1	4 , 7/2 – 4 , 5/2	0	13195.81	(0.02)	72017
	2 – 1	5 , 7/2 – 4 , 5/2	0	13198.02	(0.02)	72017
	2 – 1	2 , 7/2 – 1 , 5/2	0	13205.62	(0.02)	72017
	2 – 1	1 , 1/2 – 0 , 3/2	0	13253.62	(0.02)	72017
	2 – 1	2 , 1/2 – 3 , 3/2	0	13255.62	(0.02)	72017
	2 – 1	1 , 1/2 – 2 , 3/2	0	13258.46	(0.02)	72017
	2 – 1	2 , 1/2 – 2 , 3/2	0	13258.46	(0.02)	72017
	2 – 1	3 , 5/2 – 3 , 5/2	0	13352.16	(0.02)	72017
	2 – 1	2 , 5/2 – 2 , 5/2	0	13356.96	(0.02)	72017
	2 – 1	4 , 5/2 – 4 , 5/2	0	13360.17	(0.02)	72017
	2 – 1	1 , 5/2 – 1 , 5/2	0	13364.34	(0.02)	72017
	2 – 1	2 , 5/2 – 1 , 5/2	0	13369.46	(0.02)	72017
	2 – 1	2 , 3/2 – 3 , 5/2	0	13760.80	(0.02)	72017
	2 – 1	3 , 3/2 – 4 , 5/2	0	13763.80	(0.02)	72017
	2 – 1	3 , 3/2 – 3 , 3/2	1	12816.20	(0.02)	72017
	2 – 1	5 , 9/2 – 4 , 7/2	1	13083.38	(0.02)	72017
	2 – 1	4 , 9/2 – 3 , 7/2	1	13084.19	(0.02)	72017
	2 – 1	6 , 9/2 – 5 , 7/2	1	13086.88	(0.02)	72017
	2 – 1	3 , 9/2 – 2 , 7/2	1	13086.88	(0.02)	72017
	2 – 1	3 , 7/2 – 2 , 5/2	1	13130.84	(0.02)	72017
	2 – 1	5 , 7/2 – 4 , 5/2	1	13137.84	(0.02)	72017
	2 – 1	2 , 1/2 – 3 , 3/2	1	13195.81	(0.02)	72017
	2 – 1	3 , 5/2 – 3 , 5/2	1	13291.84	(0.02)	72017
	2 – 1	4 , 5/2 – 4 , 5/2	1	13299.94	(0.02)	72017
	4 – 3	13/2 – 11/2	0	26181.6	(1.00)	48001

ClIn

Indium Monochloride

	$^{115}In^{35}Cl$		$^{115}In^{37}Cl$		$^{113}In^{35}Cl$		$^{113}In^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	3269.479(4)	a	3134.060(4)	b	3282.991(5)	b	3147.572(4)	b
Y_{11} [MHz]	-15.521(4)	a	-14.567(4)	b	-15.617(5)	b	-14.661(4)	b
Y_{21} [MHz]	+0.0252(10)	a	+0.0232(10)	b	+0.0254(11)	b	+0.0234(10)	b
Y_{02} [kHz]	-1.544(10)	a	-1.419(10)	b	-1.557(11)	b	-1.431(10)	b
$eq_0Q(In)$ [MHz]	-657.50(20)	a						
$eq_1Q(In)$ [MHz]	-653.43(35)	a						
$eq_2Q(In)$ [MHz]	-649.39(50)	a						
$eq_eQ(In)$ [MHz]	-659.52(40)	a	-659.52(40)	c	-650.53(40)	e	-650.53(40)	e
$eq_0Q(Cl)$ [MHz]	-13.66(20)	a						
$eq_1Q(Cl)$ [MHz]	-14.13(30)	a						
$eq_2Q(Cl)$ [MHz]	-14.30(40)	a						
$eq_eQ(Cl)$ [MHz]	-13.22(40)	a	-10.42(40)	d	-13.22(40)	c	-10.42(40)	c
μ_0 [D]	3.79(10)	72008						
μ_r [amu]	26.8097927		27.9682077		26.6994522		27.8481473	

[a]Recalculation of the data from Ref. 849 and 1448.
[b]Calculated from isotopic relations from $^{115}In^{35}Cl$.
[c]From $^{115}In^{35}Cl$.
[d]Calculated with (Q_{35}/Q_{37}) = 1.2688773(15). See references 56000 and 69007.
[e]Calculated with (Q_{115}/Q_{113}) = 1.0138236(13). See reference 57000.

Additional reference: 70038.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{35}Cl$	2 – 1	6 , 9/2 – 5 , 7/2	0	12930.40	(0.10)	849
	2 – 1	5 , 9/2 – 4 , 7/2	0	12933.90	(0.10)	849
	2 – 1	6 , 9/2 – 7 , 11/2	0	12957.20	(0.10)	849
	2 – 1	7 , 11/2 – 7 , 11/2	0	12958.40	(0.05)	849
	2 – 1	4 , 11/2 – 5 , 11/2	0	12959.00	(0.05)	849
	2 – 1	5 , 11/2 – 5 , 11/2	0	12959.90	(0.05)	849
	2 – 1	6 , 11/2 – 6 , 11/2	0	12961.30	(0.05)	849
	2 – 1	5 , 9/2 – 6 , 11/2	0	12961.80	(0.05)	849
	2 – 1	2 , 7/2 – 2 , 7/2	0	12988.40	(0.05)	849
	2 – 1	5 , 7/2 – 5 , 7/2	0	12989.25	(0.05)	849
	2 – 1	5 , 7/2 – 4 , 7/2	0	12990.30	(0.05)	849
	2 – 1	3 , 7/2 – 3 , 7/2	0	12991.20	(0.05)	849
	2 – 1	4 , 7/2 – 4 , 7/2	0	12992.00	(0.05)	849
	2 – 1	7 , 13/2 – 7 , 11/2	0	13059.00	(0.05)	849
	2 – 1	7 , 13/2 – 6 , 11/2	0	13060.740	(0.02)	72008
	2 – 1	6 , 13/2 – 5 , 11/2	0	13061.044	(0.02)	72008
	2 – 1	8 , 13/2 – 7 , 11/2	0	13061.411	(0.02)	72008
	2 – 1	5 , 13/2 – 4 , 11/2	0	13061.663	(0.02)	72008
	2 – 1	5 , 13/2 – 5 , 11/2	0	13063.40	(0.05)	849
	2 – 1	4 , 5/2 – 5 , 7/2	0	13072.60	(0.10)	849

Isotopic Species	J'	← J''	F'	F'₁	← F''	F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{35}Cl$	2	1	6	9/2	5	9/2	0	13076.90	(0.10)	849
	2	1	5	11/2	4	9/2	0	13078.95	(0.05)	849
	2	1	6	11/2	5	9/2	0	13079.30	(0.05)	849
	2	1	6	9/2	6	9/2	0	13079.70	(0.05)	849
	2	1	7	11/2	6	9/2	0	13080.80	(0.06)	849
	2	1	4	9/2	4	9/2	0	13080.80	(0.06)	849
	2	1	6	11/2	6	9/2	0	13081.80	(0.10)	849
	2	1	5	9/2	6	9/2	0	13082.30	(0.10)	849
	2	1	4	9/2	3	9/2	0	13083.50	(0.10)	849
	2	1	5	7/2	5	9/2	0	13136.30	(0.10)	849
	2	1	4	7/2	5	9/2	0	13138.15	(0.05)	849
	2	1	5	7/2	6	9/2	0	13139.00	(0.05)	849
	2	1	3	7/2	3	9/2	0	13140.70	(0.10)	849
	2	1	6	9/2	5	7/2	1	12868.90	(0.10)	849
	2	1	5	9/2	4	7/2	1	12872.65	(0.10)	849
	2	1	6	9/2	7	11/2	1	12896.00	(0.15)	849
	2	1	7	11/2	7	11/2	1	12897.20	(0.15)	849
	2	1	5	11/2	5	11/2	1	12898.40	(0.15)	849
	2	1	5	9/2	6	11/2	1	12900.00	(0.15)	849
	2	1	5	7/2	5	7/2	1	12927.70	(0.10)	849
	2	1	5	7/2	4	7/2	1	12928.70	(0.10)	849
	2	1	3	7/2	3	7/2	1	12930.00	(0.10)	849
	2	1	4	7/2	4	7/2	1	12930.90	(0.10)	849
	2	1	8	13/2	7	11/2	1	12999.20	(0.10)	849
	2	1	4	5/2	5	7/2	1	13010.70	(0.10)	849
	2	1	6	11/2	5	9/2	1	13017.50	(0.15)	849
	2	1	7	11/2	6	9/2	1	13018.60	(0.10)	849
	2	1	4	9/2	4	9/2	1	13018.60	(0.10)	849
	2	1	6	9/2	5	7/2	2	12808.00	(0.15)	849
	2	1	5	9/2	4	7/2	2	12811.70	(0.15)	849
	2	1	8	13/2	7	11/2	2	12937.40	(0.10)	849
	2	1	4	5/2	5	7/2	2	12948.70	(0.10)	849
	2	1	6	11/2	5	9/2	2	12955.50	(0.15)	849
	2	1	8	13/2	7	11/2	3	12875.80	(0.15)	849
	2	1	4	5/2	5	7/2	3	12886.70	(0.15)	849
	2	1	8	13/2	7	11/2	4	12814.40	(0.15)	849
	2	1	8	13/2	7	11/2	5	12753.30	(0.20)	849
	3	2	6	9/2	5	7/2	0	19526.26	(0.50)	509
	3	2	4	9/2	3	7/2	0	19527.77	(0.50)	509
	3	2		5/2		5/2	0	19539.67	(0.50)	509
	3	2		11/2		9/2	0	19563.97	(0.50)	509
	3	2		11/2		11/2	0	19565.84	(0.50)	509
	3	2		7/2		7/2	0	19570.25	(0.50)	509
	3	2		15/2		13/2	0	19578.36	(0.50)	509
	3	2		9/2		9/2	0	19584.56	(0.50)	509
	3	2		3/2		5/2	0	19584.56	(0.50)	509
	3	2	7	13/2	6	11/2	0	19584.56	(0.50)	509
	3	2		13/2		11/2	0	19589.08	(0.50)	509
	3	2		5/2		7/2	0	19621.36	(0.50)	509
	3	2		7/2		9/2	0	19628.75	(0.50)	509
	3	2		15/2		13/2	1	19486.10	(0.50)	509
	3	2		9/2		9/2	1	19491.88	(0.50)	509
	3	2		3/2		5/2	1	19491.88	(0.50)	509
	3	2	7	13/2	6	11/2	1	19491.88	(0.50)	509
	3	2		13/2		11/2	1	19496.29	(0.50)	509
	4	3	7	15/2	6	15/2	0	26011.45	(0.15)	1448
	4	3	8	15/2	9	15/2	0	26011.45	(0.15)	1448
	4	3	6	15/2	6	15/2	0	26013.21	(0.04)	1448
	4	3	9	15/2	9	15/2	0	26013.21	(0.04)	1448
	4	3	7	15/2	7	15/2	0	26014.19	(0.04)	1448
	4	3	8	15/2	8	15/2	0	26014.19	(0.04)	1448
	4	3	6	15/2	7	15/2	0	26015.80	(0.14)	1448
	4	3	9	15/2	8	15/2	0	26015.80	(0.14)	1448
	4	3	4	5/2	3	3/2	0	26045.53	(0.07)	1448
	4	3	2	5/2	1	3/2	0	26046.09	(0.12)	1448
	4	3	2	5/2	2	3/2	0	26047.06	(0.15)	1448
	4	3	3	5/2	3	3/2	0	26047.06	(0.15)	1448
	4	3	3	5/2	2	3/2	0	26048.15	(0.10)	1448
	4	3	3	7/2	3	5/2	0	26051.51	(0.12)	1448
	4	3	4	7/2	3	5/2	0	26052.15	(0.08)	1448
	4	3	5	7/2	4	5/2	0	26052.15	(0.08)	1448
	4	3	5	9/2	4	7/2	0	26064.12	(0.07)	1448
	4	3	6	9/2	5	7/2	0	26065.30	(0.07)	1448
	4	3	5	13/2	5	13/2	0	26071.95	(0.07)	1448
	4	3		13/2		13/2	0	26072.92	(0.05)	1448
	4	3	5	11/2	6	13/2	0	26078.48	(0.08)	1448
	4	3	6	11/2	7	13/2	0	26078.48	(0.08)	1448
	4	3	3	3/2	3	3/2	0	26079.48	(0.08)	1448
	4	3	6	11/2	5	9/2	0	26080.70	(0.08)	1448
	4	3	5	11/2	4	9/2	0	26081.29	(0.06)	1448
	4	3	4	11/2	3	9/2	0	26082.10	(0.08)	1448
	4	3	7	11/2	6	9/2	0	26082.10	(0.08)	1448
	4	3	1	5/2	3	5/2	0	26090.36	(0.07)	1448
	4	3	4	5/2	3	5/2	0	26090.36	(0.07)	1448

Isotopic Species	J'	← J''	F'	F_1'	← F''	F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{35}Cl$	4	3		5/2		5/2	0	26091.95	(0.07)	1448
	4	3	3	5/2	2	5/2	0	26092.85	(0.10)	1448
	4	3	3	5/2	4	5/2	0	26093.58	(0.07)	1448
	4	3	2	5/2	1	5/2	0	26093.58	(0.07)	1448
	4	3	7	13/2	6	11/2	0	26095.81	(0.07)	1448
	4	3	8	13/2	7	11/2	0	26097.00	(0.05)	1448
	4	3		17/2		15/2	0	26098.50	(0.05)	1448
	4	3	7	15/2	6	13/2	0	26104.69	(0.06)	1448
	4	3	8	15/2	7	13/2	0	26104.69	(0.06)	1448
	4	3	6	15/2	5	13/2	0	26105.40	(0.06)	1448
	4	3	9	15/2	8	13/2	0	26105.40	(0.06)	1448
	4	3	3	3/2	3	5/2	0	26124.36	(0.12)	1448
	4	3	0	3/2	1	5/2	0	26125.03	(0.10)	1448
	4	3	1	3/2	2	5/2	0	26125.03	(0.10)	1448
	4	3	2	3/2	3	5/2	0	26125.84	(0.06)	1448
	4	3	3	3/2	4	5/2	0	26125.84	(0.06)	1448
	4	3	2	3/2	2	5/2	0	26127.00	(0.10)	1448
	4	3	3	9/2	4	11/2	0	26128.58	(0.08)	1448
	4	3	6	9/2	7	11/2	0	26128.58	(0.08)	1448
	4	3	4	9/2	5	11/2	0	26129.13	(0.08)	1448
	4	3	5	9/2	6	11/2	0	26129.13	(0.08)	1448
	4	3	4	5/2	4	7/2	0	26141.33	(0.15)	1448
	4	3		5/2		7/2	0	26143.01	(0.06)	1448
	4	3	2	5/2	2	7/2	0	26144.51	(0.10)	1448
	4	3	7	15/2	6	15/2	1	25888.02	(0.16)	1448
	4	3	8	15/2	9	15/2	1	25888.02	(0.16)	1448
	4	3	6	15/2	6	15/2	1	25889.92	(0.08)	1448
	4	3	9	15/2	9	15/2	1	25889.92	(0.08)	1448
	4	3	7	15/2	7	15/2	1	25890.84	(0.08)	1448
	4	3	8	15/2	8	15/2	1	25890.84	(0.08)	1448
	4	3	4	5/2	3	3/2	1	25922.09	(0.10)	1448
	4	3	2	5/2	1	3/2	1	25922.75	(0.15)	1448
	4	3	2	5/2	2	3/2	1	25923.62	(0.15)	1448
	4	3	3	5/2	3	3/2	1	25923.62	(0.15)	1448
	4	3	3	5/2	2	3/2	1	26924.67	(0.10)	1448
	4	3		7/2		5/2	1	25928.66	(0.10)	1448
	4	3	5	9/2	4	7/2	1	25940.57	(0.05)	1448
	4	3	4	9/2	3	7/2	1	25941.13	(0.08)	1448
	4	3	6	9/2	5	7/2	1	25941.71	(0.08)	1448
	4	3	5	13/2	5	13/2	1	25948.36	(0.10)	1448
	4	3		13/2		13/2	1	25949.27	(0.08)	1448
	4	3	8	13/2	7	13/2	1	25950.27	(0.05)	1448
	4	3	5	11/2	6	13/2	1	25954.65	(0.05)	1448
	4	3	6	11/2	7	13/2	1	25954.65	(0.05)	1448
	4	3	3	3/2	3	3/2	1	25955.78	(0.07)	1448
	4	3	6	11/2	5	9/2	1	25956.97	(0.05)	1448
	4	3	5	11/2	4	9/2	1	25957.56	(0.05)	1448
	4	3	4	11/2	3	9/2	1	25958.35	(0.07)	1448
	4	3	7	11/2	6	9/2	1	25958.35	(0.07)	1448
	4	3	1	5/2	2	5/2	1	25966.70	(0.07)	1448
	4	3	4	5/2	3	5/2	1	25966.70	(0.07)	1448
	4	3		5/2		5/2	1	25968.17	(0.06)	1448
	4	3	3	5/2	4	5/2	1	25969.75	(0.15)	1448
	4	3	2	5/2	1	5/2	1	25969.75	(0.15)	1448
	4	3	7	13/2	6	11/2	1	25972.00	(0.05)	1448
	4	3	8	13/2	7	11/2	1	25973.21	(0.05)	1448
	4	3		17/2		15/2	1	25974.74	(0.07)	1448
	4	3	7	15/2	6	13/2	1	25980.67	(0.05)	1448
	4	3	8	15/2	7	13/2	1	25980.67	(0.05)	1448
	4	3	6	15/2	5	13/2	1	25981.47	(0.10)	1448
	4	3	9	15/2	8	13/2	1	25981.47	(0.10)	1448
	4	3	3	3/2	3	5/2	1	26000.42	(0.15)	1448
	4	3	0	3/2	1	5/2	1	26001.17	(0.12)	1448
	4	3	1	3/2	2	5/2	1	26001.17	(0.12)	1448
	4	3	2	3/2	3	5/2	1	26001.87	(0.07)	1448
	4	3	3	3/2	4	5/2	1	26001.87	(0.07)	1448
	4	3	3	9/2	4	11/2	1	26004.62	(0.14)	1448
	4	3	6	9/2	7	11/2	1	26004.62	(0.14)	1448
	4	3	4	9/2	5	11/2	1	26005.12	(0.06)	1448
	4	3	5	9/2	6	11/2	1	26005.12	(0.06)	1448
	4	3		5/2		7/2	1	26018.96	(0.08)	1448
	4	3	2	7/2	3	9/2	1	26022.70	(0.08)	1448
	4	3	3	7/2	4	9/2	1	26022.70	(0.08)	1448
	4	3	4	7/2	5	9/2	1	26023.20	(0.08)	1448
	4	3	5	7/2	6	9/2	1	26023.20	(0.08)	1448
	4	3	6	15/2	6	15/2	2	25767.10	(0.10)	1448
	4	3	9	15/2	9	15/2	2	25767.10	(0.10)	1448
	4	3	7	15/2	7	15/2	2	25768.13	(0.10)	1448
	4	3	8	15/2	8	15/2	2	25768.13	(0.10)	1448
	4	3	4	5/2	3	3/2	2	25799.06	(0.20)	1448
	4	3		7/2		5/2	2	25805.24	(0.12)	1448
	4	3		9/2		7/2	2	25817.90	(0.10)	1448
	4	3		13/2		13/2	2	25826.10	(0.06)	1448

Isotopic Species	J'	J''	F'	F_1'	F''	F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{35}Cl$	4	3	5	11/2	6	13/2	2	25831.39	(0.15)	1448
	4	3	6	11/2	7	13/2	2	25831.39	(0.15)	1448
	4	3	6	11/2	5	9/2	2	25833.82	(0.08)	1448
	4	3		5/2		5/2	2	25844.95	(0.07)	1448
	4	3	7	13/2	6	11/2	2	25848.80	(0.10)	1448
	4	3	7	13/2	6	11/2	2	25848.80	(0.10)	1448
	4	3	5	13/2	4	11/2	2	25849.78	(0.10)	1448
	4	3	8	13/2	7	11/2	2	25849.78	(0.10)	1448
	4	3		17/2		15/2	2	25851.35	(0.08)	1448
	4	3		11/2		11/2	2	25854.46	(0.10)	1448
	4	3	7	15/2	6	13/2	2	25857.45	(0.07)	1448
	4	3	8	15/2	7	13/2	2	25857.45	(0.07)	1448
	4	3	6	15/2	5	13/2	2	25858.07	(0.08)	1448
	4	3	9	15/2	8	13/2	2	25858.07	(0.08)	1448
	4	3		9/2		9/2	2	25861.44	(0.08)	1448
	4	3	2	3/2	3	5/2	2	25878.20	(0.06)	1448
	4	3	3	3/2	4	5/2	2	25878.20	(0.06)	1448
	4	3		9/2		11/2	2	25881.16	(0.07)	1448
	4	3		5/2		7/2	2	25895.35	(0.12)	1448
	4	3		7/2		9/2	2	25899.35	(0.10)	1448
	4	3		15/2		15/2	3	25644.86	(0.15)	1448
	4	3		7/2		5/2	3	25682.50	(0.15)	1448
	4	3		9/2		7/2	3	25695.24	(0.12)	1448
	4	3		13/2		13/2	3	25702.97	(0.12)	1448
	4	3	5	11/2	6	13/2	3	25708.36	(0.25)	1448
	4	3	6	11/2	7	13/2	3	25708.36	(0.25)	1448
	4	3		11/2		9/2	3	25711.45	(0.10)	1448
	4	3		5/2		5/2	3	25721.85	(0.08)	1448
	4	3	7	13/2	6	11/2	3	25725.76	(0.08)	1448
	4	3	6	13/2	5	11/2	3	25725.76	(0.08)	1448
	4	3	7	13/2	6	11/2	3	25725.76	(0.08)	1448
	4	3		17/2		15/2	3	25728.33	(0.08)	1448
	4	3		11/2		11/2	3	25731.50	(0.08)	1448
	4	3	7	15/2	6	13/2	3	25734.32	(0.08)	1448
	4	3	8	15/2	7	13/2	3	25734.32	(0.08)	1448
	4	3	6	15/2	5	13/2	3	25734.90	(0.08)	1448
	4	3	9	15/2	8	13/2	3	25734.90	(0.08)	1448
	4	3		9/2		9/2	3	25738.28	(0.08)	1448
	4	3	2	3/2	3	5/2	3	25755.12	(0.15)	1448
	4	3	3	3/2	4	5/2	3	25755.12	(0.15)	1448
	4	3		9/2		11/2	3	25758.00	(0.15)	1448
	4	3		5/2		7/2	3	25771.91	(0.10)	1448
	4	3		7/2		9/2	3	25776.09	(0.12)	1448
$^{115}In^{37}Cl$	2	1	6	9/2	5	7/2	0	12391.00	(0.10)	849
	2	1	5	9/2	4	7/2	0	12393.70	(0.06)	849
	2	1	6	9/2	7	11/2	0	12418.00	(0.10)	849
	2	1	7	11/2	7	11/2	0	12418.90	(0.10)	849
	2	1	5	11/2	5	11/2	0	12420.00	(0.10)	849
	2	1	5	9/2	6	11/2	0	12421.35	(0.10)	849
	2	1	2	7/2	2	7/2	0	12449.10	(0.10)	849
	2	1	5	7/2	5	7/2	0	12449.75	(0.10)	849
	2	1	5	7/2	4	7/2	0	12450.55	(0.10)	849
	2	1	3	7/2	3	7/2	0	12451.30	(0.10)	849
	2	1	4	7/2	4	7/2	0	12451.90	(0.10)	849
	2	1	7	13/2	7	11/2	0	12519.70	(0.10)	849
	2	1	8	13/2	7	11/2	0	12521.40	(0.10)	849
	2	1	5	13/2	5	11/2	0	12523.00	(0.10)	849
	2	1	5	5/2	4	7/2	0	12532.90	(0.10)	849
	2	1	6	9/2	5	9/2	0	12538.00	(0.10)	849
	2	1	6	11/2	5	9/2	0	12539.90	(0.10)	849
	2	1	6	9/2	6	9/2	0	12539.90	(0.10)	849
	2	1	7	11/2	6	9/2	0	12540.85	(0.06)	849
	2	1	4	9/2	4	9/2	0	12540.85	(0.06)	849
	2	1	4	7/2	5	9/2	0	12598.45	(0.06)	849
	2	1	5	7/2	6	9/2	0	12599.10	(0.06)	849
	2	1	6	9/2	5	7/2	1	12333.60	(0.10)	849
	2	1	5	9/2	4	7/2	1	12336.30	(0.10)	849
	2	1	6	9/2	7	11/2	1	12360.35	(0.15)	849
	2	1	7	11/2	7	11/2	1	12361.20	(0.15)	849
	2	1	5	11/2	5	11/2	1	12362.30	(0.15)	849
	2	1	5	9/2	6	11/2	1	12363.60	(0.15)	849
	2	1	8	13/2	7	11/2	1	12463.30	(0.10)	849
	2	1	4	5/2	5	7/2	1	12474.60	(0.10)	849
	2	1	6	9/2	5	9/2	1	12479.60	(0.10)	849
	2	1	6	11/2	5	9/2	1	12481.60	(0.10)	849
	2	1	6	9/2	6	9/2	1	12481.60	(0.10)	849
	2	1	7	11/2	6	9/2	1	12482.50	(0.06)	849
	2	1	4	9/2	4	9/2	1	12482.50	(0.06)	849
	2	1	6	9/2	5	7/2	2	12276.30	(0.15)	849
	2	1	5	9/2	4	7/2	2	12278.90	(0.15)	849
	2	1	8	13/2	7	11/2	2	12405.30	(0.10)	849
	2	1	4	5/2	5	7/2	2	12416.65	(0.10)	849
	2	1	6	11/2	5	9/2	2	12423.45	(0.10)	849
	2	1	6	9/2	6	9/2	2	12423.45	(0.10)	849

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{37}Cl$	2 − 1	4 , 9/2 − 4 , 9/2	2	12424.40	(0.10)	849
	2 − 1	8 , 13/2 − 7 , 11/2	3	12289.50	(0.20)	849
	2 − 1	8 , 13/2 − 7 , 11/2	3	12347.30	(0.10)	849
	2 − 1	4 , 5/2 − 5 , 7/2	3	12358.65	(0.15)	849
	3 − 2	15/2 − 13/2	0	18768.93	(0.50)	509
$^{113}In^{35}Cl$	2 − 1	8 , 13/2 − 7 , 11/2	0	13114.90	(0.10)	849
	2 − 1	4 , 5/2 − 5 , 7/2	0	13126.00	(0.10)	849
	2 − 1	6 , 11/2 − 5 , 9/2	0	13132.80	(0.10)	849
	2 − 1	6 , 9/2 − 6 , 9/2	0	13132.80	(0.10)	849
	2 − 1	7 , 11/2 − 6 , 9/2	0	13134.10	(0.10)	849
	2 − 1	4 , 9/2 − 4 , 9/2	0	13134.10	(0.10)	849
	2 − 1	4 , 7/2 − 5 , 9/2	0	13190.80	(0.10)	849
	2 − 1	5 , 7/2 − 6 , 9/2	0	13191.60	(0.10)	849
	2 − 1	8 , 13/2 − 7 , 11/2	1	13052.00	(0.10)	849
$^{113}In^{37}Cl$	2 − 1	8 , 13/2 − 7 , 11/2	0	12575.10	(0.20)	849
	2 − 1	4 , 5/2 − 5 , 7/2	0	12586.00	(0.20)	849
	2 − 1	6 , 11/2 − 5 , 9/2	0	12593.10	(0.20)	849
	2 − 1	6 , 9/2 − 6 , 9/2	0	12593.10	(0.20)	849
	2 − 1	7 , 11/2 − 6 , 9/2	0	12593.10	(0.20)	849
	2 − 1	4 , 9/2 − 4 , 9/2	0	12593.10	(0.20)	849
	2 − 1	5 , 7/2 − 6 , 9/2	0	12651.50	(0.40)	849
	2 − 1	8 , 13/2 − 7 , 11/2	1	12516.60	(0.20)	849
	2 − 1	8 , 13/2 − 7 , 11/2	2	12458.20	(0.20)	849

ClK

Potassium Chloride

	$^{39}K^{35}Cl$	$^{39}K^{37}Cl$		$^{41}K^{35}Cl$	
Constant	Value (Unc.)	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	3856.370(2)	3746.583(2)	53001	3767.394(2)	53001
Y_{11} [MHz]	-23.680(2)	-22.676(2)	53001	-22.865(2)	53001
Y_{21} [MHz]	0.050(2)	0.047(2)	53001	0.048(2)	53001
Y_{02} [kHz]	-3.260(3)	-3.078(4)	1171	-3.111(3)	a
Y_{12} [kHz]	+0.0025(3)	+0.0041(40)	1171		
Y_{03} [Hz]	-0.623(8)	-0.571(8)	1171		
$eq_0Q(K)$ [MHz]	-5.6684(3)	-5.6682(15)	1711	-6.899(6)	53001
$eq_1Q(K)$ [MHz]	-5.6157(9)	-5.6170(30)	1711	-6.840(10)	53001
$eq_2Q(K)$ [MHz]	-5.5646(9)		1711		
$eq_3Q(K)$ [MHz]	-5.5163(9)		1711		
$eq_4Q(K)$ [MHz]	-5.4650(20)		1711		
$eq_eQ(K)$ [MHz]	-5.69503(65)		1711		
$eq_0Q(Cl)$ [MHz]	0.0585(8)	0.0465(15)	1711		
$eq_1Q(Cl)$ [MHz]	-0.1003(17)	-0.0769(20)	1711		
$eq_2Q(Cl)$ [MHz]	-0.2588(29)		1711		
$eq_3Q(Cl)$ [MHz]	-0.4137(31)		1711		
$eq_4Q(Cl)$ [MHz]	-0.5544(38)		1711		
$eq_eQ(Cl)$ [MHz]	0.1405(16)		1711		
c_K [kHz]	0.81(25)		1711		
c_{Cl} [kHz]	0.40(15)		1711		
c_3 [kHz]	0.50(25)		1711		
c_4 [kHZ]	-0.30(23)		1711		
μ_0 [D]	10.2690(10)	10.2687(10)	1711		
μ_1 [D]	10.3290(10)	10.3277(10)	1711		
μ_2 [D]	10.3895(10)		1711		
μ_3 [D]	10.4503(10)		1711		
μ_4 [D]	10.5114(10)		1711		
μ_e [D]	10.2391(10)		1711		
μ_r [amu]	18.4291763	18.9692618		18.8644184	

[a] Calculated with isotope relations from Y_{02} of $^{39}K^{35}Cl$.

Additional references: 68000, 52005, 138.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{39}K^{35}Cl$	1 – 0	3/2 – 3/2	0	7687.942	(0.01)	53001
	1 – 0	5/2 – 3/2	0	7689.356	(0.01)	53001
	1 – 0	1/2 – 3/2	0	7690.487	(0.01)	53001
	1 – 0	3/2 – 3/2	1	7640.790	(0.01)	53001
	1 – 0	5/2 – 3/2	1	7642.200	(0.01)	53001
	1 – 0	1/2 – 3/2	1	7643.316	(0.01)	53001
	1 – 0	3/2 – 3/2	2	7593.850	(0.01)	53001
	1 – 0	1/2 – 3/2	2	7596.347	(0.01)	53001
	1 – 0	3/2 – 3/2	3	7547.110	(0.02)	53001
	1 – 0	1/2 – 3/2	3	7549.569	(0.02)	53001
	3 – 2		0	23067.5	(0.50)	138
	3 – 2		1	22925.4	(0.50)	138
	3 – 2		2	22785.2	(1.00)	138
	3 – 2		3	22644.0	(2.00)	138
	13 – 12		0	99929.54	(0.10)	1171
	13 – 12		1	99316.44	(0.10)	1171
	20 – 19		0	153677.48	(0.10)	1171
	25 – 24		0	192023.49	(0.10)	1171
	25 – 24		1	190844.49	(0.10)	1171
	25 – 24		2	189670.52	(0.10)	1171
	30 – 29		0	230320.56	(0.10)	1171
	30 – 29		1	228905.95	(0.10)	1171
	35 – 34		0	268558.98	(0.15)	1171
$^{39}K^{37}Cl$	1 – 0	3/2 – 3/2	0	7469.370	(0.01)	53001
	1 – 0	5/2 – 3/2	0	7470.776	(0.01)	53001
	1 – 0	1/2 – 3/2	0	7471.917	(0.01)	53001
	1 – 0	1/2 – 3/2	1	7426.754	(0.01)	53001
	3 – 2		0	22410.3	(1.50)	138
	3 – 2		1	22278.0	(3.00)	138
	19 – 18		1	140997.10	(0.10)	1171
	22 – 21		0	164220.00	(0.10)	1171
	24 – 23		0	179121.98	(0.10)	1171
	24 – 23		1	178038.18	(0.10)	1171
	36 – 35		0	268363.84	(0.15)	1171
$^{41}K^{35}Cl$	1 – 0	3/2 – 3/2	0	7510.555	(0.01)	53001
	1 – 0	5/2 – 3/2	0	7512.280	(0.01)	53001
	1 – 0	1/2 – 3/2	0	7513.659	(0.01)	53001
	1 – 0	1/2 – 3/2	1	7468.107	(0.01)	53001

ClLi

Lithium Chloride

	$^{6}Li^{35}Cl$	$^{6}Li^{37}Cl$	$^{7}Li^{35}Cl$	$^{7}Li^{37}Cl$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	24116.578(5)	23725.383(6)	21181.004(4)	20989.825(6)	69004
Y_{11} [MHz]	-291.760(6)	-288.305(9)	-240.122(5)	-236.894(8)	69004
Y_{21} [MHz]	1.547(2)	1.526(3)	1.189(1)	1.172(2)	69004
Y_{02} [kHz]	-132.56(4)	-130.42(4)	-102.19(2)	-100.41(3)	69004
Y_{12} [kHz]	0.80(2)	0.77(3)	0.57(2)	0.52(3)	69004
$eq_0Q(Cl)$ [MHz]	-3.07212(11)	-2.42081(14)			68001
$eq_1Q(Cl)$ [MHz]	-3.47869(12)	-2.73956(15)			68001
$eq_2Q(Cl)$ [MHz]	-3.87286(21)	-3.05190(27)			68001
$eq_3Q(Cl)$ [MHz]	-4.250(11)				320
$eq_eQ(Cl)$ [MHz]	-2.86418(28)	-2.25903(36)			68001
c_{Cl} [kHz]	2.30(20)	1.80(25)			68001
μ_0 [D]	7.1289(10)	7.1287(10)			68000
μ_1 [D]	7.2168(10)	7.2163(10)			68000
μ_2 [D]	7.3059(10)	7.3052(10)			68000
μ_e [D]	7.0853(13)	7.0853(13)			68000
μ_r [amu]	5.1322977	5.1733169	5.8435744	5.8968100	

Isotopic Species	$J' \leftarrow J''$	$F' \; F_1' \leftarrow F'' \; F_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{6}Li^{35}Cl$	1 – 0		0	47941.645	(0.01)	68001
	1 – 0		1	47364.314	(0.01)	68001
	1 – 0		2	46793.167	(0.01)	68001
	3 – 2		0	143812.25	(0.10)	69004
	3 – 2		1	142080.39	(0.10)	69004
	3 – 2		2	140366.96	(0.10)	69004
	3 – 2		3	138672.25	(0.10)	69004
	4 – 3		0	191734.87	(0.10)	69004
	4 – 3		1	189425.70	(0.10)	69004
	5 – 4		0	239644.77	(0.10)	69004
	6 – 5		0	287538.84	(0.10)	69004
	6 – 5		1	284075.59	(0.10)	69004
	6 – 5		2	280649.43	(0.10)	69004
	7 – 6		0	335413.85	(0.10)	69004
	7 – 6		1	331373.70	(0.10)	69004
	7 – 6		2	327376.87	(0.10)	69004
	10 – 9		0	478893.22	(0.10)	69004
	10 – 9		1	473123.40	(0.10)	69004

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{6}Li^{35}Cl$	10 – 9		2	467415.12	(0.10)	69004
$^{6}Li^{37}Cl$	1 – 0		0	47562.708	(0.01)	68001
	3 – 2		0	142675.64	(0.10)	69004
	3 – 2		1	140964.20	(0.10)	69004
	3 – 2		2	139271.10	(0.10)	69004
	4 – 3		0	190219.61	(0.10)	69004
	4 – 3		1	187937.80	(0.10)	69004
	4 – 3		2	185680.41	(0.10)	69004
	6 – 5		0	285267.05	(0.10)	69004
	6 – 5		1	281844.58	(0.10)	69004
	7 – 6		0	332764.13	(0.10)	69004
	7 – 6		1	328771.68	(0.10)	69004
	7 – 6		2	324821.92	(0.10)	69004
	10 – 9		0	475112.22	(0.10)	69004
	10 – 9		1	469410.42	(0.10)	69004
$^{7}Li^{35}Cl$	1 – 0		0	42122.2	(0.20)	1210
	1 – 0		1	41646.6	(0.20)	1210
	1 – 0		2	41175.8	(0.20)	1210
	4 – 3		0	168463.84	(0.10)	69004
	4 – 3		1	166562.04	(0.10)	69004
	4 – 3		2	164679.28	(0.10)	69004
	5 – 4		0	210561.50	(0.10)	69004
	5 – 4		1	208184.31	(0.10)	69004
	5 – 4		2	205830.92	(0.10)	69004
	5 – 4		3	203501.30	(0.10)	69004
	6 – 5		0	252646.80	(0.10)	69004
	6 – 5		1	249794.36	(0.10)	69004
	6 – 5		2	246970.49	(0.10)	69004
	6 – 5		3	244175.15	(0.10)	69004
	8 – 7		0	336771.14	(0.10)	69004
	8 – 7		1	332968.36	(0.10)	69004
	8 – 7		2	329203.68	(0.10)	69004
	11 – 10		0	462804.95	(0.10)	69004
	11 – 10		1	457577.67	(0.10)	69004
$^{7}Li^{37}Cl$	1 – 0		0	41743.1	(0.20)	1210
	1 – 0		1	41274.1	(0.20)	1210
	4 – 3		0	166947.76	(0.10)	69004
	4 – 3		1	165071.41	(0.10)	69004
	4 – 3		2	163213.99	(0.10)	69004
	5 – 4		0	208666.65	(0.10)	69004
	5 – 4		1	206321.40	(0.10)	69004
	5 – 4		2	203999.55	(0.10)	69004
	6 – 5		0	250373.49	(0.10)	69004
	6 – 5		1	247559.38	(0.10)	69004
	6 – 5		2	244773.35	(0.10)	69004
	7 – 6		0	292066.02	(0.10)	69004
	8 – 7		0	333741.59	(0.10)	69004
	8 – 7		1	329989.98	(0.10)	69004
	8 – 7		2	326275.66	(0.10)	69004
	11 – 10		0	458643.70	(0.10)	69004

ClNa

Sodium Chloride

	$^{23}Na^{35}Cl$		$^{23}Na^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	6537.367(6)	1171	6397.287(6)	1171
Y_{11} [MHz]	-48.711(9)	1171	-47.151(9)	1171
Y_{21} [MHz]	0.154(8)	1171	0.147(8)	1171
Y_{02} [kHz]	-9.354(5)	1171	-8.963(6)	1171
Y_{12} [kHz]	0.025(5)	1171	0.019(6)	1171
Y_{03} [Hz]	-1.02(1)	1171	-0.95(1)	1171
$eq_0Q(Na)$ [MHz]	-5.6698(60)	70040	-5.6740(9)	70040
$eq_1Q(Na)$ [MHz]	-5.6169(25)	70040	-5.6122(19)	70040
$eq_2Q(Na)$ [MHz]	-5.5614(3)	70040		
$eq_3Q(Na)$ [MHz]	-5.4960(20)	70040		
$eq_0Q(Cl)$ [MHz]	-5.6468(60)	70040	-4.4470(13)	70040
$eq_1Q(Cl)$ [MHz]	-5.8167(25)	70040	-4.5829(22)	70040
$eq_2Q(Cl)$ [MHz]	-5.9852(30)	70040		
$eq_3Q(Cl)$ [MHz]	-6.1588(20)	70040		
c_{Na} [kHz]	1.00(41)	70040	1.01(54)	70040
c_{Cl} [kHz]	0.00(40)	70040	-0.47(54)	70040
c_3 [kHz]	0.24(15)	70040	0.25(22)	70040
c_4 [kHz]	0.00(30)	70040	-0.09(25)	70040
μ_0 [D]	9.0012(10)	70040	9.0009(10)	70040
μ_1 [D]	9.0611(10)	70040	9.0601(10)	70040
μ_2 [D]	9.1214(10)	70040		
μ_3 [D]	9.1823(10)	70040		
μ_e [D]	8.9714(10)	70040		
μ_r [amu]	13.8706867		14.1744321	

Additional References: 68000, 69005.

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{23}Na^{35}Cl$	2 − 1		0	26051.1	(0.75)	65
	2 − 1		1	25857.6	(0.75)	65
	2 − 1		2	25666.5	(0.75)	65
	2 − 1		3	25473.9	(0.75)	65
	8 − 7		0	104189.74	(0.10)	1171
	12 − 11		0	156248.60	(0.10)	1171
	14 − 13		0	182262.89	(0.10)	1171
	14 − 13		1	180907.78	(0.10)	1171
	15 − 14		0	195265.39	(0.10)	1171
	15 − 14		1	193813.63	(0.10)	1171
	15 − 14		2	192371.05	(0.10)	1171
	17 − 16		0	221260.15	(0.10)	1171
	18 − 17		0	234251.83	(0.10)	1171
	18 − 17		1	232509.95	(0.10)	1171
	21 − 20		0	273202.04	(0.15)	1171
	24 − 23		0	312109.88	(0.20)	1171
	24 − 23		1	309787.82	(0.10)	1171
$^{23}Na^{37}Cl$	2 − 1		0	25493.9	(0.75)	65
	2 − 1		1	25307.5	(0.75)	65
	2 − 1		2	25120.3	(0.75)	65
	9 − 8		0	114701.33	(0.10)	1171
	9 − 8		1	113858.03	(0.10)	1171
	12 − 11		1	151783.57	(0.10)	1171
	15 − 14		0	191091.62	(0.10)	1171
	15 − 14		1	189686.13	(0.10)	1171
	17 − 16		0	216531.44	(0.10)	1171

ClO

Chlorine Monoxide

	$^{35}Cl^{16}O$	$^{37}Cl^{16}O$	
Constant	Value (Unc.)	Value (Unc.)	Ref.
B_{01} [MHz]	18624.04(15)	18308.47(16)	69006
B_{02} [MHz]	18580.32(21)	18266.61(21)	69006
D_e [MHz]	0.077(16)	0.074(30)[a]	69006
p_{eff} [MHz]	674.22(78)	662.49(85)	69006
a+(b+c)/2 [MHz]	112.60(65)	93.85(71)	69006
a-(b+c)/2 [MHz]	160.07(71)	133.36(77)	69006
d [MHz]	173.07(70)	143.96(77)	69006
eqQ(Cl) [MHz]	-87.0(15)	-69.4(17)	69006
B_0 [MHz]	18602.86(13)	18288.21(13)	69006
α_p [MHz]	-335.6(4)	-329.8(4)	69006
β_p [MHz]	0.74(2)	0.72(2)	69006
ω_e [cm^{-1}]	616(61)	(610)[a]	69006
A [cm^{-1}]	-282(9)	-282(9)	67003
μ_0 [D]	1.239(20)		69006
μ_r [amu]	10.9749310	11.1642248	

[a]Calculated from the value of D_e for ^{35}ClO.

Additional references: 70043, 1597, 68006

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Parity	Ref.
$^{35}Cl^{16}O$ $^2\Pi_{1/2}$	3/2 – 1/2	3 – 2	0	55488.77	(0.10)	a	69006
	3/2 – 1/2	2 – 1	0	55528.28	(0.10)	a	69006
	3/2 – 1/2	2 – 2	0	55545.76	(0.10)	a	69006
	3/2 – 1/2	1 – 1	0	55595.73	(0.10)	a	69006
	3/2 – 1/2	1 – 2	0	55613.34	(0.10)	a	69006
	3/2 – 1/2	0 – 1	0	55638.16	(0.10)	a	69006
	3/2 – 1/2	1 – 2	0	55860.75	(0.10)	b	69006
	3/2 – 1/2	2 – 2	0	55977.98	(0.10)	b	69006
	3/2 – 1/2	3 – 2	0	56197.06	(0.10)	b	69006
	3/2 – 1/2	0 – 1	0	56254.35	(0.10)	b	69006
	3/2 – 1/2	1 – 1	0	56304.74	(0.10)	b	69006
	3/2 – 1/2	2 – 1	0	56422.18	(0.10)	b	69006
	5/2 – 3/2	4 – 3	0	92759.02	(0.10)	a	69006
	5/2 – 3/2	3 – 2	0	92764.70	(0.10)	a	69006
	5/2 – 3/2	2 – 1	0	92769.93	(0.10)	a	69006
	5/2 – 3/2	4 – 3	0	93447.58	(0.10)	b	69006
	5/2 – 3/2	3 – 2	0	93492.00	(0.10)	b	69006
	5/2 – 3/2	2 – 1	0	93504.74	(0.10)	b	69006
$^{37}Cl^{16}O$ $^2\Pi_{1/2}$	3/2 – 1/2	3 – 2	0	54554.89	(0.10)	a	69006
	3/2 – 1/2	2 – 1	0	54589.12	(0.10)	a	69006
	3/2 – 1/2	2 – 2	0	54603.58	(0.10)	a	69006
	3/2 – 1/2	1 – 1	0	54644.72	(0.10)	a	69006
	3/2 – 1/2	1 – 2	0	54659.05	(0.10)	a	69006
	3/2 – 1/2	0 – 1	0	54679.19	(0.10)	a	69006
	3/2 – 1/2	1 – 2	0	54966.43	(0.10)	b	69006
	3/2 – 1/2	2 – 2	0	55064.71	(0.10)	b	69006
	3/2 – 1/2	3 – 2	0	55245.91	(0.10)	b	69006
	3/2 – 1/2	0 – 1	0	55293.84	(0.10)	b	69006
	3/2 – 1/2	1 – 1	0	55335.78	(0.10)	b	69006
	3/2 – 1/2	2 – 1	0	55434.29	(0.10)	b	69006
$^{35}Cl^{16}O$ $^2\Pi_{3/2}$	5/2 – 3/2	2 – 3	0	92736.18	(0.10)		69006
	5/2 – 3/2	3 – 3	0	92791.08	(0.10)		69006
	5/2 – 3/2	1 – 2	0	92820.03	(0.10)		69006
	5/2 – 3/2	2 – 2	0	92853.77	(0.10)		69006
	5/2 – 3/2	4 – 3	0	92873.91	(0.10)		69006
	5/2 – 3/2	3 – 2	0	92909.13	(0.10)		69006
	5/2 – 3/2	1 – 1	0	92927.82	(0.10)		69006
	5/2 – 3/2	2 – 1	0	92961.55	(0.10)		69006
	5/2 – 3/2	1 – 0	0	92990.03	(0.10)		69006
$^{37}Cl^{16}O$ $^2\Pi_{3/2}$	5/2 – 3/2	3 – 3	0	91240.63	(0.10)		69006
	5/2 – 3/2	1 – 2	0	91264.81	(0.10)		69006
	5/2 – 3/2	2 – 2	0	91293.38	(0.10)		69006
	5/2 – 3/2	4 – 3	0	91308.79	(0.10)		69006
	5/2 – 3/2	3 – 2	0	91339.09	(0.10)		69006
	5/2 – 3/2	1 – 1	0	91353.69	(0.10)		69006
	5/2 – 3/2	2 – 1	0	91382.31	(0.10)		69006
	5/2 – 3/2	1 – 0	0	91405.42	(0.10)		69006

ClRb

Rubidium Chloride

	$^{85}Rb^{35}Cl$		$^{85}Rb^{37}Cl$	$^{87}Rb^{35}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	2627.394(3)	144	2526.856(4)	2609.774(4)	1171
Y_{11} [MHz]	-13.600(4)	1171,144	-12.826(5)	-13.458(6)	1171
Y_{21} [MHz]	0.021(1)	1171,144	0.019(2)	0.020(1)	1171
Y_{02} [kHz]	-1.483(1)	1171	-1.371(1)	-1.461(1)	1171
Y_{12} [kHz]	-0.7(4)	1171	-0.3(10)	-1.9(10)	1171
Y_{03} [Hz]	-0.248(2)	1171	-0.221(2)	-0.243(2)	1171
$eq_0Q(Rb)$ [MHz]	-52.675(5)	144		-25.485(6)	144
$eq_1Q(Rb)$ [MHz]	-52.306(30)	144			
$eq_2Q(Rb)$ [MHz]	-51.903(40)	144			
$eq_eQ(Rb)$ [MHz]	-52.884(45)	144			
$eq_0Q(Cl)$ [MHz]	+0.744(9)	144			
$eq_1Q(Cl)$ [MHz]	+0.612(13)	144			
$eq_2Q(Cl)$ [MHz]	+0.470(17)	144			
$eq_eQ(Cl)$ [MHz]	0.840(16)	144			
c_{Rb} [kHz]	0.3(3)	144			
c_{Cl} [kHz]	0.0(8)	144			
μ_0 [D]	10.510(5)	68000			
μ_1 [D]	10.564(5)	68000			
μ_2 [D]	10.618(5)	68000			
μ_e [D]	10.483(6)	68000			
μ_r [amu]	24.7685361		25.7540245	24.9357031	

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{85}Rb^{35}Cl$	1 – 0	3 , 5/2 – 4 , 5/2	0	5232.671	(0.01)	144
	1 – 0	2 , 5/2 – 4 , 5/2	0	5232.750	(0.01)	144
	1 – 0	4 , 5/2 – 4 , 5/2	0	5232.809	(0.01)	144
	1 – 0	1 , 5/2 – 4 , 5/2	0	5232.889	(0.01)	144
	1 – 0	2 , 7/2 – 4 , 5/2	0	5243.745	(0.01)	144
	1 – 0	5 , 7/2 – 4 , 5/2	0	5243.788	(0.01)	144
	1 – 0	3 , 7/2 – 4 , 5/2	0	5243.855	(0.01)	144
	1 – 0	4 , 7/2 – 4 , 5/2	0	5243.905	(0.01)	144
	1 – 0	3 , 3/2 – 4 , 5/2	0	5248.566	(0.01)	144
	1 – 0	1 , 3/2 – 4 , 5/2	0	5248.566	(0.01)	144
	1 – 0	2 , 3/2 – 4 , 5/2	0	5248.596	(0.01)	144
	1 – 0	2 , 7/2 – 4 , 5/2	1	5216.630	(0.01)	144
	1 – 0	5 , 7/2 – 4 , 5/2	1	5216.660	(0.01)	144
	1 – 0	3 , 7/2 – 4 , 5/2	1	5216.712	(0.01)	144
	1 – 0	4 , 7/2 – 4 , 5/2	1	5216.752	(0.01)	144
	1 – 0	3 , 3/2 – 4 , 5/2	1	5221.395	(0.01)	144
	1 – 0	1 , 3/2 – 4 , 5/2	1	5221.395	(0.01)	144
	1 – 0	2 , 3/2 – 4 , 5/2	1	5221.421	(0.01)	144
	1 – 0	2 , 7/2 – 4 , 5/2	2	5189.587	(0.01)	144
	1 – 0	5 , 7/2 – 4 , 5/2	2	5189.616	(0.01)	144
	1 – 0	3 , 7/2 – 4 , 5/2	2	5189.656	(0.01)	144
	1 – 0	4 , 7/2 – 4 , 5/2	2	5189.681	(0.01)	144
	1 – 0	3 , 3/2 – 4 , 5/2	2	5194.306	(0.01)	144
	1 – 0	1 , 3/2 – 4 , 5/2	2	5194.306	(0.01)	144
	21 – 20		1	109440.74	(0.10)	1171
	34 – 33		0	177967.57	(0.10)	1171
	34 – 33		1	177045.49	(0.10)	1171
	34 – 33		2	176126.30	(0.10)	1171
	34 – 33		3	175209.82	(0.10)	1171
	35 – 34		0	183187.48	(0.10)	1171
	35 – 34		1	182238.38	(0.10)	1171
	35 – 34		2	181292.02	(0.10)	1171
	35 – 34		3	180348.70	(0.10)	1171
	42 – 41		0	219690.65	(0.10)	1171
	42 – 41		1	218551.58	(0.10)	1171
	49 – 48		0	256120.42	(0.10)	1171
	49 – 48		1	254791.36	(0.10)	1171
$^{85}Rb^{37}Cl$	35 – 34		0	176196.16	(0.10)	1171
	35 – 34		1	175300.90	(0.10)	1171
	35 – 34		2	174408.33	(0.10)	1171
	36 – 35		0	181216.30	(0.10)	1171
	36 – 35		1	180295.47	(0.10)	1171
	42 – 41		0	211311.17	(0.10)	1171
$^{87}Rb^{35}Cl$	1 – 0	3 , 3/2 – 3 , 3/2	0	5201.032	(0.01)	144
	1 – 0	1 , 3/2 – 3 , 3/2	0	5201.032	(0.01)	144
	1 – 0	4 , 5/2 – 3 , 3/2	0	5207.332	(0.01)	144
	1 – 0	2 , 5/2 – 3 , 3/2	0	5207.389	(0.01)	144
	1 – 0	2 , 1/2 – 3 , 3/2	0	5212.474	(0.01)	144
	1 – 0	1 , 1/2 – 3 , 3/2	0	5212.474	(0.01)	144
	28 – 27		1	144890.88	(0.10)	1171
	30 – 29		0	156025.06	(0.10)	1171
	34 – 33		0	176777.46	(0.10)	1171
	38 – 37		1	196490.65	(0.10)	1171
	41 – 40		0	213046.83	(0.10)	1171

ClTl

Thallium Chloride

	$^{205}Tl^{35}Cl$		$^{205}Tl^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	2740.0138(7)	1284	2613.559(2)	1284
Y_{11} [MHz]	-11.9297(5)	1284	-11.112(2)	1284
Y_{21} [MHz]	0.01250(7)	1284	0.0111(3)	1284
Y_{02} [MHz]	-1.125(5)	1284	-1.010(8)	1284
$eq_0Q(Cl)$ [MHz]	-15.7933(5)	69007	-12.4459(5)	69007
$eq_1Q(Cl)$ [MHz]	-15.8739(5)	69007	-12.5076(9)	72018
$eq_2Q(Cl)$ [MHz]	-15.9540(6)	72018		
$eq_3Q(Cl)$ [MHz]	-16.0329(20)	72018		
$eq_eQ(Cl)$ [MHz]	-15.7520(3)	72018		
$c_{Tl}(v=0)$ [kHz]	76.35(10)	69007	72.82(15)	69007
$c_{Tl}(v=1)$ [kHz]	75.98(10)	69007	72.4(13)	72018
$c_{Tl}(v=2)$ [kHz]	75.62(50)	72018		
c_{Cl} [kHz]	1.38(10)	69007	1.10(15)	69007
c_3 [kHz]	-0.13(10)	69007	-0.13(15)	69007
c_4 [kHz]	-1.55(10)	69007	-1.28(15)	69007
μ_0 [D]	4.54295(200)[a]	72018	4.54230(200)[a]	72018
μ_1 [D]	4.59837(200)[a]	72018	4.59643(200)[a]	72018
μ_2 [D]	4.65396(200)[a]	72018		
μ_3 [D]	4.70969(200)[a]	72018		
μ_e [D]	4.5153(20)	72018		
g_J [μ_n]	-0.02806(4)	72018	-0.02661(7)	72018
μ_r [amu]	29.8725631		31.3179074	

	$^{203}Tl^{35}Cl$		$^{203}Tl^{37}Cl$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	2743.9502(13)	1284	2617.4977(21)	1284
Y_{11} [MHz]	-11.9551(9)	1284	-11.1342(32)	1284
Y_{21} [MHz]	0.01248(12)	1284	0.0107(8)	1284
Y_{02} [kHz]	-1.120(6)	1284	-1.029(8)	1284
$eq_0Q(Cl)$ [MHz]	-15.7933(5)	69007	-12.4466(2)	69007
$eq_1Q(Cl)$ [MHz]	-15.8750(15)	72018		
$c_{Tl}(v=0)$ [kHz]	75.77(16)	69007	71.80(50)	69007
$c_{Tl}(v=1)$ [kHz]	75.4(4)	72018		
c_{Cl} [kHz]	1.40(10)	69007	1.21(50)	69007
c_3 [kHz]	-0.09(10)	69007	-0.56(50)	69007
c_4 [kHz]	-1.52(10)	69007	-1.11(50)	69007
μ_0 [D]	4.54299(200)[a]	72018	4.54231(200)[a]	72018
μ_1 [D]	4.59845(200)[a]	72018		
g_J [μ_n]	-0.02798(7)	72018		
μ_r [amu]	29.8296818		31.2707795	

[a]Relative error is 3 ppm, while the absolute error is shown.

Additional references: 52006, 52007, 1285, 213, 509.

Isotopic Species	J′	← J″	F′	F′₁ ←	F″	F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{205}Tl^{35}Cl$	2	– 1		7/2 –		5/2	0	10936.48	(0.02)	530
	2	– 1		5/2 –		3/2	0	10936.48	(0.02)	530
	2	– 1		3/2 –		3/2	0	10939.30	(0.02)	530
	2	– 1		7/2 –		5/2	1	10888.80	(0.03)	530
	2	– 1		5/2 –		3/2	1	10888.80	(0.03)	530
	2	– 1		7/2 –		5/2	2	10841.66	(0.03)	530
	2	– 1		5/2 –		3/2	2	10841.66	(0.03)	530
	4	– 3		9/2 –		9/2	0	21868.31	(0.02)	1284
	4	– 3		7/2 –		9/2	0	21869.80	(0.10)	1284
	4	– 3		7/2 –		5/2	0	21871.82	(0.02)	1284
	4	– 3		5/2 –		3/2	0	21871.82	(0.02)	1284
	4	– 3		11/2 –		9/2	0	21872.25	(0.02)	1284
	4	– 3		9/2 –		7/2	0	21872.25	(0.02)	1284
	4	– 3		7/2 –		7/2	0	21873.62	(0.02)	1284
	4	– 3		5/2 –		5/2	0	21875.74	(0.02)	1284
	4	– 3		5/2 –		7/2	0	21877.50	(0.15)	1284
	4	– 3		9/2 –		9/2	1	21773.07	(0.02)	1284
	4	– 3		7/2 –		5/2	1	21776.59	(0.03)	1284
	4	– 3		5/2 –		3/2	1	21776.59	(0.03)	1284
	4	– 3		11/2 –		9/2	1	21777.03	(0.02)	1284
	4	– 3		9/2 –		7/2	1	21777.03	(0.02)	1284
	4	– 3		7/2 –		7/2	1	21778.39	(0.02)	1284
	4	– 3		5/2 –		5/2	1	21780.53	(0.04)	1284
	4	– 3		9/2 –		9/2	2	21678.03	(0.03)	1284
	4	– 3		5/2 –		3/2	2	21681.56	(0.03)	1284
	4	– 3		7/2 –		5/2	2	21681.56	(0.03)	1284
	4	– 3		11/2 –		9/2	2	21682.01	(0.02)	1284
	4	– 3		9/2 –		7/2	2	21682.01	(0.02)	1284
	4	– 3		7/2 –		7/2	2	21683.37	(0.03)	1284
	4	– 3		5/2 –		5/2	2	21685.50	(0.05)	1284
	4	– 3		9/2 –		9/2	3	21583.09	(0.05)	1284
	4	– 3		7/2 –		5/2	3	21586.68	(0.03)	1284
	4	– 3		5/2 –		3/2	3	21586.68	(0.03)	1284
	4	– 3		11/2 –		9/2	3	21587.10	(0.02)	1284
	4	– 3		9/2 –		7/2	3	21587.10	(0.02)	1284
	4	– 3		7/2 –		7/2	3	21588.50	(0.05)	1284
	4	– 3		5/2 –		5/2	3	21590.60	(0.07)	1284
	4	– 3		9/2 –		9/2	4	21488.49	(0.10)	1284
	4	– 3		7/2 –		5/2	4	21492.00	(0.06)	1284
	4	– 3		5/2 –		3/2	4	21492.00	(0.06)	1284
	4	– 3		11/2 –		9/2	4	21492.43	(0.04)	1284
	4	– 3		9/2 –		7/2	4	21492.43	(0.04)	1284
	4	– 3		7/2 –		7/2	4	21493.80	(0.20)	1284
	4	– 3		5/2 –		5/2	4	21495.95	(0.15)	1284
	4	– 3		7/2 –		5/2	5	21397.65	(0.10)	1284
	4	– 3		5/2 –		3/2	5	21397.65	(0.10)	1284
	4	– 3		11/2 –		9/2	5	21398.05	(0.10)	1284
	4	– 3		9/2 –		7/2	5	21398.05	(0.10)	1284
	4	– 3					6	21303.80	(0.10)	1284
	4	– 3					7	21209.60	(0.10)	1284
	5	– 4		11/2 –		11/2	0	27336.08	(0.02)	1284
	5	– 4		9/2 –		7/2	0	27339.75	(0.03)	1284
	5	– 4		7/2 –		5/2	0	27339.75	(0.03)	1284
	5	– 4		13/2 –		11/2	0	27340.04	(0.02)	1284
	5	– 4		11/2 –		9/2	0	27340.04	(0.02)	1284
	5	– 4		9/2 –		9/2	0	27341.14	(0.02)	1284
	5	– 4		7/2 –		7/2	0	27343.70	(0.02)	1284
	5	– 4		11/2 –		11/2	1	27217.05	(0.04)	1284
	5	– 4		9/2 –		7/2	1	27220.74	(0.04)	1284
	5	– 4		7/2 –		5/2	1	27220.74	(0.04)	1284
	5	– 4		13/2 –		11/2	1	27221.01	(0.02)	1284
	5	– 4		11/2 –		9/2	1	27221.01	(0.02)	1284
	5	– 4		9/2 –		9/2	1	27222.10	(0.02)	1284
	5	– 4		7/2 –		7/2	1	27224.70	(0.02)	1284
	5	– 4		11/2 –		11/2	2	27098.22	(0.03)	1284
	5	– 4		9/2 –		7/2	2	27101.91	(0.03)	1284
	5	– 4		7/2 –		5/2	2	27101.91	(0.03)	1284
	5	– 4		13/2 –		11/2	2	27102.19	(0.03)	1284
	5	– 4		11/2 –		9/2	2	27102.19	(0.03)	1284
	5	– 4		9/2 –		9/2	2	27103.31	(0.03)	1284
	5	– 4		7/2 –		7/2	2	27105.93	(0.03)	1284
	5	– 4		11/2 –		11/2	3	26979.64	(0.05)	1284
	5	– 4		9/2 –		7/2	3	26983.34	(0.10)	1284
	5	– 4		7/2 –		5/2	3	26983.34	(0.10)	1284
	5	– 4		13/2 –		11/2	3	26983.64	(0.04)	1284
	5	– 4		11/2 –		9/2	3	26983.64	(0.04)	1284
	5	– 4		9/2 –		9/2	3	26984.75	(0.04)	1284
	5	– 4		7/2 –		7/2	3	26987.37	(0.03)	1284
	5	– 4		11/2 –		11/2	4	26861.31	(0.10)	1284
	5	– 4		9/2 –		7/2	4	26865.05	(0.05)	1284
	5	– 4		7/2 –		5/2	4	26865.05	(0.05)	1284
	5	– 4		13/2 –		11/2	4	26865.33	(0.03)	1284
	5	– 4		11/2 –		9/2	4	26865.33	(0.03)	1284
	5	– 4		9/2 –		9/2	4	26866.51	(0.10)	1284

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{205}Tl^{35}Cl$	5 – 4	7/2 – 7/2	4	26869.12	(0.10)	1284
	5 – 4	13/2 – 11/2	5	26747.25	(0.03)	1284
	5 – 4	11/2 – 9/2	5	26747.25	(0.03)	1284
	5 – 4	9/2 – 9/2	5	26748.60	(0.10)	1284
	5 – 4	7/2 – 7/2	5	26751.14	(0.10)	1284
	5 – 4		6	26629.44	(0.04)	1284
	5 – 4		7	26511.88	(0.04)	1284
	5 – 4		8	26394.59	(0.05)	1284
	5 – 4		9	26277.50	(0.06)	1284
	5 – 4		0	26160.88	(0.15)	1284
	7 – 6	15/2 – 15/2	0	38271.29	(0.02)	1284
	7 – 6	17/2 – 15/2	0	38275.21	(0.02)	1284
	7 – 6	15/2 – 13/2	0	38275.21	(0.02)	1284
	7 – 6	13/2 – 13/2	0	38276.01	(0.03)	1284
	7 – 6	11/2 – 11/2	0	38279.04	(0.02)	1284
	9 – 8		0	49209.64	(0.03)	1284
	9 – 8		1	48995.38	(0.04)	1284
	9 – 8		2	48781.62	(0.08)	1284
	11 – 10		0	60143.12	(0.04)	1284
	11 – 10		1	59881.28	(0.04)	1284
	11 – 10		2	59619.94	(0.04)	1284
	11 – 10		3	59359.10	(0.04)	1284
	11 – 10		4	59098.82	(0.04)	1284
$^{205}Tl^{37}Cl$	2 – 1	5/2 – 3/2	0	10432.38	(0.06)	530
	2 – 1	7/2 – 5/2	0	10432.38	(0.06)	530
	2 – 1	3/2 – 3/2	0	10434.48	(0.06)	530
	2 – 1	5/2 – 3/2	1	10387.80	(0.12)	530
	2 – 1	7/2 – 5/2	1	10387.80	(0.12)	530
	4 – 3	9/2 – 9/2	0	20860.80	(0.04)	1284
	4 – 3	7/2 – 5/2	0	20863.52	(0.05)	1284
	4 – 3	5/2 – 3/2	0	20863.52	(0.05)	1284
	4 – 3	11/2 – 9/2	0	20863.88	(0.03)	1284
	4 – 3	9/2 – 7/2	0	20863.88	(0.03)	1284
	4 – 3	7/2 – 7/2	0	20864.98	(0.04)	1284
	4 – 3	5/2 – 5/2	0	20866.63	(0.04)	1284
	4 – 3	9/2 – 9/2	1	20772.00	(0.10)	1284
	4 – 3	7/2 – 5/2	1	20774.72	(0.10)	1284
	4 – 3	5/2 – 3/2	1	20774.72	(0.10)	1284
	4 – 3	11/2 – 9/2	1	20775.13	(0.05)	1284
	4 – 3	9/2 – 7/2	1	20775.13	(0.05)	1284
	4 – 3	7/2 – 7/2	1	20776.30	(0.10)	1284
	4 – 3	5/2 – 5/2	1	20777.85	(0.10)	1284
	5 – 4	11/2 – 11/2	0	26076.53	(0.04)	1284
	5 – 4	9/2 – 7/2	0	26079.43	(0.05)	1284
	5 – 4	7/2 – 5/2	0	26079.43	(0.05)	1284
	5 – 4	13/2 – 11/2	0	26079.62	(0.03)	1284
	5 – 4	11/2 – 9/2	0	26079.62	(0.03)	1284
	5 – 4	9/2 – 9/2	0	26080.47	(0.04)	1284
	5 – 4	7/2 – 7/2	0	26082.53	(0.04)	1284
	5 – 4	11/2 – 11/2	1	25965.63	(0.05)	1284
	5 – 4	9/2 – 7/2	1	25968.52	(0.05)	1284
	5 – 4	7/2 – 5/2	1	25968.52	(0.05)	1284
	5 – 4	13/2 – 11/2	1	25968.72	(0.03)	1284
	5 – 4	11/2 – 9/2	1	25968.72	(0.03)	1284
	5 – 4	9/2 – 9/2	1	25969.62	(0.05)	1284
	5 – 4	7/2 – 7/2	1	25971.63	(0.05)	1284
	5 – 4		2	25858.03	(0.04)	1284
	5 – 4		3	25747.50	(0.10)	1284
	5 – 4		4	25637.29	(0.05)	1284
	5 – 4		5	25527.30	(0.05)	1284
	5 – 4		6	25417.50	(0.10)	1284
	5 – 4		7	25307.98	(0.10)	1284
	9 – 8		0	46941.14	(0.04)	1284
	9 – 8		1	46741.50	(0.08)	1284
	11 – 10		0	57370.76	(0.04)	1284
	11 – 10		1	57126.80	(0.03)	1284
$^{203}Tl^{35}Cl$	2 – 1	5/2 – 3/2	0	10952.16	(0.03)	530
	2 – 1	7/2 – 5/2	0	10952.16	(0.03)	530
	2 – 1	5/2 – 3/2	1	10904.36	(0.03)	530
	2 – 1	7/2 – 5/2	1	10904.36	(0.03)	530
	4 – 3	9/2 – 9/2	0	21899.74	(0.04)	1284
	4 – 3	7/2 – 5/2	0	21903.22	(0.04)	1284
	4 – 3	5/2 – 3/2	0	21903.22	(0.04)	1284
	4 – 3	11/2 – 9/2	0	21903.62	(0.04)	1284
	4 – 3	9/2 – 7/2	0	21903.62	(0.04)	1284
	4 – 3	7/2 – 7/2	0	21904.98	(0.04)	1284
	4 – 3	5/2 – 5/2	0	21907.13	(0.04)	1284
	4 – 3	9/2 – 9/2	1	21804.24	(0.03)	1284
	4 – 3	7/2 – 5/2	1	21807.76	(0.03)	1284
	4 – 3	5/2 – 3/2	1	21807.76	(0.03)	1284
	4 – 3	11/2 – 9/2	1	21808.20	(0.02)	1284
	4 – 3	9/2 – 7/2	1	21808.20	(0.02)	1284
	4 – 3	7/2 – 7/2	1	21809.58	(0.02)	1284
	4 – 3	5/2 – 5/2	1	21811.70	(0.02)	1284

Isotopic Species	J' ← J''	F' F1' ← F'' F1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{203}Tl^{35}Cl$	4 – 3	9/2 – 9/2	2	21709.00	(0.05)	1284
	4 – 3	7/2 – 5/2	2	21712.51	(0.03)	1284
	4 – 3	5/2 – 3/2	2	21712.51	(0.03)	1284
	4 – 3	11/2 – 9/2	2	21712.96	(0.02)	1284
	4 – 3	9/2 – 7/2	2	21712.96	(0.02)	1284
	4 – 3	7/2 – 7/2	2	21714.35	(0.05)	1284
	4 – 3	5/2 – 5/2	2	21716.50	(0.05)	1284
	4 – 3	9/2 – 9/2	3	21613.92	(0.10)	1284
	4 – 3	7/2 – 5/2	3	21617.46	(0.08)	1284
	4 – 3	5/2 – 3/2	3	21617.46	(0.08)	1284
	4 – 3	11/2 – 9/2	3	21617.89	(0.05)	1284
	4 – 3	9/2 – 7/2	3	21617.89	(0.05)	1284
	4 – 3	7/2 – 7/2	3	21619.23	(0.10)	1284
	4 – 3	5/2 – 5/2	3	21621.39	(0.20)	1284
	4 – 3	7/2 – 5/2	4	21522.50	(0.10)	1284
	4 – 3	5/2 – 3/2	4	21522.50	(0.10)	1284
	4 – 3	11/2 – 9/2	4	21523.02	(0.10)	1284
	4 – 3	9/2 – 7/2	4	21523.02	(0.10)	1284
	4 – 3		5	21428.22	(0.10)	1284
	4 – 3		6	21333.76	(0.10)	1284
	5 – 4	11/2 – 11/2	0	27375.33	(0.03)	1284
	5 – 4	9/2 – 7/2	0	27379.00	(0.04)	1284
	5 – 4	7/2 – 5/2	0	27379.00	(0.04)	1284
	5 – 4	13/2 – 11/2	0	27379.28	(0.03)	1284
	5 – 4	11/2 – 9/2	0	27379.28	(0.03)	1284
	5 – 4	9/2 – 9/2	0	27380.37	(0.03)	1284
	5 – 4	7/2 – 7/2	0	27382.93	(0.03)	1284
	5 – 4	11/2 – 11/2	1	27256.03	(0.03)	1284
	5 – 4	9/2 – 7/2	1	27259.73	(0.06)	1284
	5 – 4	7/2 – 5/2	1	27259.73	(0.06)	1284
	5 – 4	13/2 – 11/2	1	27259.99	(0.02)	1284
	5 – 4	11/2 – 9/2	1	27259.99	(0.02)	1284
	5 – 4	9/2 – 9/2	1	27261.07	(0.04)	1284
	5 – 4	7/2 – 7/2	1	27263.68	(0.03)	1284
	5 – 4	11/2 – 11/2	2	27136.97	(0.04)	1284
	5 – 4	9/2 – 7/2	2	27140.62	(0.04)	1284
	5 – 4	7/2 – 5/2	2	27140.62	(0.04)	1284
	5 – 4	13/2 – 11/2	2	27140.91	(0.04)	1284
	5 – 4	11/2 – 9/2	2	27140.91	(0.04)	1284
	5 – 4	9/2 – 9/2	2	27142.01	(0.05)	1284
	5 – 4	7/2 – 7/2	2	27144.64	(0.05)	1284
	5 – 4	11/2 – 11/2	3	27018.14	(0.05)	1284
	5 – 4	9/2 – 7/2	3	27021.88	(0.05)	1284
	5 – 4	7/2 – 5/2	3	27021.88	(0.05)	1284
	5 – 4	13/2 – 11/2	3	27022.12	(0.04)	1284
	5 – 4	11/2 – 9/2	3	27022.12	(0.04)	1284
	5 – 4	9/2 – 9/2	3	27023.22	(0.10)	1284
	5 – 4	7/2 – 7/2	3	27025.84	(0.10)	1284
	5 – 4	9/2 – 7/2	4	26903.30	(0.10)	1284
	5 – 4	7/2 – 5/2	4	26903.30	(0.10)	1284
	5 – 4	13/2 – 11/2	4	26903.56	(0.04)	1284
	5 – 4	11/2 – 9/2	4	26903.56	(0.04)	1284
	5 – 4		5	26785.22	(0.04)	1284
	5 – 4		6	26667.16	(0.06)	1284
	5 – 4		7	26549.40	(0.10)	1284
	5 – 4		8	26431.76	(0.10)	1284
	5 – 4		9	26314.37	(0.10)	1284
	5 – 4		0	26197.50	(0.10)	1284
	9 – 8		0	49280.28	(0.04)	1284
	9 – 8		1	49065.64	(0.08)	1284
	11 – 10		0	60229.52	(0.04)	1284
	11 – 10		1	59967.04	(0.04)	1284
	11 – 10		2	59705.12	(0.04)	1284
$^{203}Tl^{37}Cl$	2 – 1	5/2 – 3/2	0	10447.98	(0.06)	530
	2 – 1	7/2 – 5/2	0	10447.98	(0.06)	530
	2 – 1	5/2 – 3/2	1	10403.28	(0.06)	530
	2 – 1	7/2 – 5/2	1	10403.28	(0.06)	530
	4 – 3	9/2 – 9/2	0	20892.17	(0.04)	1284
	4 – 3	7/2 – 5/2	0	20894.92	(0.03)	1284
	4 – 3	5/2 – 3/2	0	20894.92	(0.03)	1284
	4 – 3	11/2 – 9/2	0	20895.30	(0.02)	1284
	4 – 3	9/2 – 7/2	0	20895.30	(0.02)	1284
	4 – 3	7/2 – 7/2	0	20896.40	(0.04)	1284
	4 – 3	5/2 – 5/2	0	20898.05	(0.04)	1284
	4 – 3		1	20806.17	(0.10)	1284
	4 – 3		2	20717.36	(0.15)	1284
	5 – 4	11/2 – 11/2	0	26115.80	(0.05)	1284
	5 – 4	9/2 – 7/2	0	26118.65	(0.05)	1284
	5 – 4	7/2 – 5/2	0	26118.65	(0.05)	1284
	5 – 4	13/2 – 11/2	0	26118.87	(0.03)	1284
	5 – 4	11/2 – 9/2	0	26118.87	(0.03)	1284
	5 – 4	9/2 – 9/2	0	26119.75	(0.05)	1284
	5 – 4	7/2 – 7/2	0	26121.80	(0.10)	1284
	5 – 4		1	26007.80	(0.05)	1284

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{203}Tl^{37}Cl$	5 – 4		2	25896.77	(0.05)	1284
	5 – 4		3	25786.05	(0.05)	1284
	5 – 4		4	25675.60	(0.10)	1284
	5 – 4		5	25565.35	(0.15)	1284
	9 – 8		0	47011.90	(0.08)	1284
	9 – 8		1	46811.84	(0.08)	1284
	11 – 10		0	57457.04	(0.04)	1284
	11 – 10		1	57212.56	(0.04)	1284

CsF

Cesium Fluoride

	$^{133}Cs^{19}F$	
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	5527.2643(19)	73001
Y_{11} [MHz]	-35.2443(30)	73001
Y_{21} [MHz]	0.03537(98)	73001
Y_{31} [kHz]	0.532(83)	73001
Y_{02} [kHz]	-6.0463(16)	73001
Y_{12} [Hz]	-9.2(19)	73001
Y_{03} [10^{-3}Hz]	-0.2130(12)	73001
Y_{04} [10^{-9}Hz]	-5.37(36)	73001
$eq_0Q(Cs)$ [MHz]	1.2370(13)	1610
$eq_1Q(Cs)$ [MHz]	1.2230(14)	1610
$eq_2Q(Cs)$ [MHz]	1.2090(14)	1610
$eq_3Q(Cs)$ [MHa]	1.1919(35)	71014
$eq_4Q(Cs)$ [MHz]	1.1770(36)	71014
$eq_5Q(Cs)$ [MHz]	1.1639(46)	71014
$eq_6Q(Cs)$ [MHz]	1.1554(45)	71014
$eq_7Q(Cs)$ [MHz]	1.1449(52)	71014
$eq_8Q(Cs)$ [MHz]	1.1283(48)	71014
$eq_eQ(Cs)$ [MHz]	1.2456(28)	71014
c_{Cs} [kHz]	0.70(7)	1610
c_F [kHz]	15.1(6)	1610
c_3 [kHz]	0.92(12)	1610
c_4 [kHz]	0.61(10)	1610
μ_0 [D]	7.8839(9)	68000
μ_1 [D]	7.9546(10)	68000
μ_2 [D]	8.0257(10)	68000
μ_3 [D]	8.0957(20)	71014
μ_4 [D]	8.1676(20)	71014
μ_5 [D]	8.2395(20)	71014
μ_6 [D]	8.3124(20)	71014
μ_7 [D]	8.3854(20)	71014
μ_8 [D]	8.4585(20)	71014
μ_e [D]	7.8786(13)	68000
$g_J(v=0)$ [μ_n]	-0.0642(3)	1306
$g_J(v=1)$ [μ_n]	-0.0639(5)	1306
μ_r [amu]	16.622300	

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{133}Cs^{19}F$	2 – 1		0	22038.51	(0.20)	65
	2 – 1		1	21898.21	(0.40)	65
	2 – 1		2	21757.58	(0.60)	65
	2 – 1		3	21617.09	(0.60)	65
	2 – 1		4	21477.5	(1.00)	65
	3 – 2		0	33057.266	(0.03)	73001
	3 – 2		1	32846.229	(0.03)	73001
	3 – 2		2	32635.629	(0.03)	73001
	3 – 2		3	32425.543	(0.03)	73001
	3 – 2		4	32215.907	(0.03)	73001
	3 – 2		5	32006.855	(0.03)	73001
	3 – 2		6	31798.169	(0.10)	73001
	3 – 2		7	31590.176	(0.06)	73001
	3 – 2		8	31382.743	(0.06)	73001
	3 – 2		9	31175.963	(0.15)	73001
	9 – 8		0	99156.072	(0.10)	1404
	9 – 8		1	98522.943	(0.10)	1404
	9 – 8		2	97891.179	(0.10)	1404
	9 – 8		3	97260.822	(0.10)	1404
	10 – 9		0	110168.823	(0.10)	1404
	10 – 9		1	109465.332	(0.10)	1404
	10 – 9		2	108763.371	(0.10)	1404
	13 – 12		0	143197.757	(0.10)	1404
	13 – 12		1	142283.228	(0.10)	1404
	13 – 12		2	141370.596	(0.10)	1404
	16 – 15		0	176209.640	(0.10)	1404
	17 – 16		0	187209.275	(0.10)	1404
	17 – 16		1	186013.250	(0.10)	1404
	17 – 16		2	184819.760	(0.10)	1404
	19 – 18		0	209200.722	(0.10)	1404
	20 – 19		0	220192.344	(0.10)	1404
	21 – 20		0	231181.206	(0.10)	1404
	21 – 20		1	229703.592	(0.10)	1404
	28 – 27		0	308009.125	(0.10)	1404

CsI

Cesium Iodide

$^{133}Cs^{127}I$		
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	708.33033(46)	73001
Y_{11} [MHz]	-2.04646(21)	73001
Y_{21} [kHz]	1.467(24)	73001
Y_{31} [Hz]	3.43(76)	73001
Y_{02} [kHz]	-0.111362(14)	73001
Y_{12} [Hz]	-0.0689(51)	73001
Y_{03} [10^{-6}Hz]	-7.5078(39)	73001
Y_{04} [10^{-12}Hz]	-2.661(52)	73001
$eq_0Q(Cs)$ [MHz]	≤ 1	72009
$eq_0Q(I)$ [MHz]	-15.33(15)	72009
$eq_1Q(I)$ [MHz]	-17.40(30)	72009
$eq_2Q(I)$ [MHz]	-19.50(40)	72009
$eq_3Q(I)$ [MHz]	-21.78(70)	72009
$eq_eQ(I)$ [MHz]	-14.28(35)	72009
μ_0 [D]	11.69(10)	68001
μ_r [amu]	64.9178261	

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{133}Cs^{127}I$	3 − 2	9/2 − 9/2	0	4241.193	(0.03)	72009
	3 − 2	3/2 − 1/2	0	4242.592	(0.04)	72009
	3 − 2	5/2 − 3/2	0	4242.592	(0.04)	72009
	3 − 2	7/2 − 5/2	0	4243.422	(0.04)	72009
	3 − 2	7/2 − 7/2	0	4244.070	(0.03)	72009
	3 − 2	9/2 − 7/2	0	4244.070	(0.03)	72009
	3 − 2	11/2 − 9/2	0	4244.070	(0.03)	72009
	3 − 2	5/2 − 5/2	0	4244.823	(0.04)	72009
	3 − 2	3/2 − 5/2	0	4246.612	(0.03)	72009
	3 − 2	9/2 − 9/2	1	4228.593	(0.03)	72009
	3 − 2	3/2 − 1/2	1	4230.138	(0.03)	72009
	3 − 2	5/2 − 3/2	1	4230.138	(0.03)	72009
	3 − 2	7/2 − 5/2	1	4231.125	(0.04)	72009
	3 − 2	7/2 − 7/2	1	4231.856	(0.03)	72009
	3 − 2	9/2 − 7/2	1	4231.856	(0.03)	72009
	3 − 2	11/2 − 9/2	1	4231.856	(0.03)	72009
	3 − 2	9/2 − 9/2	2	4216.004	(0.03)	72009
	3 − 2	3/2 − 1/2	2	4217.697	(0.04)	72009
	3 − 2	5/2 − 3/2	2	4217.697	(0.04)	72009
	3 − 2	7/2 − 5/2	2	4218.855	(0.04)	72009
	3 − 2	7/2 − 7/2	2	4219.661	(0.03)	72009
	3 − 2	9/2 − 7/2	2	4219.661	(0.03)	72009
	3 − 2	11/2 − 9/2	2	4219.661	(0.03)	72009
	3 − 2	3/2 − 1/2	3	4205.319	(0.04)	72009
	3 − 2	5/2 − 3/2	3	4205.319	(0.04)	72009

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{133}Cs^{127}I$	3 - 2	7/2 - 7/2	3	4207.482	(0.04)	72009
	3 - 2	9/2 - 7/2	3	4207.482	(0.04)	72009
	3 - 2	11/2 - 9/2	3	4207.482	(0.04)	72009
	3 - 2	7/2 - 7/2	4	4195.263	(0.04)	72009
	3 - 2	9/2 - 7/2	4	4195.263	(0.04)	72009
	3 - 2	11/2 - 9/2	4	4195.263	(0.04)	72009
	16 - 15		0	23632.26	(0.10)	65
	16 - 15		1	22567.02	(0.10)	65
	17 - 16		0	24046.40	(0.10)	65
	17 - 16		1	23976.96	(0.10)	65
	17 - 16		2	23907.70	(0.10)	65
	17 - 16		3	23838.47	(0.10)	65
	18 - 17		0	25460.53	(0.10)	65
	18 - 17		1	25387.04	(0.10)	65
	18 - 17		2	25313.66	(0.10)	65
	20 - 19		0	28288.739	(0.02)	73001
	20 - 19		1	28207.039	(0.03)	73001
	20 - 19		2	28125.374	(0.03)	73001
	20 - 19		3	28043.870	(0.03)	73001
	20 - 19		4	27962.476	(0.02)	73001
	20 - 19		5	27881.180	(0.03)	73001
	20 - 19		6	27800.088	(0.02)	73001
	20 - 19		7	27719.038	(0.03)	73001
	20 - 19		8	27638.153	(0.02)	73001
	20 - 19		9	27557.403	(0.02)	73001
	20 - 19		0	27476.771	(0.03)	73001
	20 - 19		1	27396.229	(0.03)	73001
	20 - 19		2	27315.812	(0.04)	73001
	20 - 19		3	27235.574	(0.03)	73001
	20 - 19		4	27155.458	(0.04)	73001
	20 - 19		5	27075.439	(0.04)	73001
	20 - 19		6	26995.496	(0.04)	73001
	20 - 19		7	26915.795	(0.07)	73001
	20 - 19		8	26836.106	(0.07)	73001
	20 - 19		9	26756.662	(0.05)	73001
	20 - 19		0	26677.405	(0.05)	73001
	20 - 19		1	26598.146	(0.04)	73001
	20 - 19		3	26440.047	(0.10)	73001
	20 - 19		4	26361.387	(0.10)	73001
	104 -103		0	146618.15	(0.10)	1019
	111 -110		0	156412.03	(0.10)	1019
	111 -110		1	155957.84	(0.10)	1019
	111 -110		2	155504.71	(0.10)	1019
	128 -127		0	180134.69	(0.10)	1019
	128 -127		1	179610.97	(0.10)	1019
	128 -127		2	179088.04	(0.10)	1019
	128 -127		3	178565.72	(0.10)	1019
	129 -128		1	180999.32	(0.10)	1019
	135 -134		0	189874.72	(0.10)	1019
	139 -138		0	195432.52	(0.10)	1019
	139 -138		1	194863.62	(0.10)	1019
	139 -138		2	194295.66	(0.10)	1019
	140 -139		3	195104.71	(0.10)	1019

CuF

Copper Monofluoride

	$^{63}Cu^{19}F$		$^{65}Cu^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	11374.214(20)	70000	11293.053(20)	70000
Y_{11} [MHz]	-96.826(25)	70000	-95.797(25)	70000
Y_{21} [MHz]	0.369(17)	70000	0.363(17)[b]	70000
Y_{02} [kHz]	-16.89[a]	70000	-16.65[b]	70000
$eq_0Q(Cu)$ [MHz]	21.95(10)	70000	20.32(10)	70000
$eq_1Q(Cu)$ [MHz]	21.96(10)	70000		
$eq_eQ(Cu)$ [MHz]	21.96(10)	70000		
c_{Cu} [kHz]	33(10)	70000	40(10)	70000
μ_0 [D]	5.77(20)	70000		
μ_r [amu]	14.592836		14.697728	

[a]From $Y_{02} = -4\, B_e^3/\omega_e^2$ where ω_e = 622.65 cm^{-1} (Ref. 50000).

[b]Calculated from isotope relations.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{63}Cu^{19}F$	1 – 0	1/2 – 3/2	0	22646.150	(0.02)	70000
	1 – 0	5/2 – 3/2	0	22650.685	(0.02)	70000
	1 – 0	3/2 – 3/2	0	22656.083	(0.02)	70000
	1 – 0	1/2 – 3/2	1	22453.975	(0.02)	70000
	1 – 0	5/2 – 3/2	1	22458.490	(0.02)	70000
	1 – 0	3/2 – 3/2	1	22463.905	(0.02)	70000
	1 – 0	5/2 – 3/2	2	22267.792	(0.05)	70000
	2 – 1	1/2 – 3/2	0	45293.020	(0.05)	70000
	2 – 1	3/2 – 3/2	0	45298.563	(0.05)	70000
	2 – 1	7/2 – 5/2	0	45302.569	(0.05)	70000
	2 – 1	5/2 – 5/2	0	45308.210	(0.05)	70000
	2 – 1	3/2 – 3/2	1	44914.190	(0.05)	70000
	2 – 1	7/2 – 5/2	1	44918.249	(0.05)	70000
$^{65}Cu^{19}F$	1 – 0	1/2 – 3/2	0	22485.250	(0.02)	70000
	1 – 0	5/2 – 3/2	0	22489.474	(0.02)	70000
	1 – 0	3/2 – 3/2	0	22494.456	(0.02)	70000
	2 – 1	7/2 – 5/2	0	44980.044	(0.05)	70000
	2 – 1	7/2 – 5/2	1	44599.764	(0.05)	70000

FGa

Gallium Monofluoride

	$^{69}Ga^{19}F$		$^{71}Ga^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	10778.023(8)	70002	10712.379(8)	70002
Y_{11} [MHz]	-85.868(8)	70002	-85.084(8)	70002
Y_{21} [MHz]	0.305(8)	70002	+0.301(8)	70002
Y_{02} [kHz]	-15.0(15)	70002	-14.8(15)	70002
eq_0Q(Ga) [MHz]	-106.52(6)	70002	-67.12(6)	70002
eq_1Q(Ga) [MHz]	-105.43(6)	70002	-66.44(6)	70002
eq_2Q(Ga) [MHz]	-104.35(6)	70002	-65.76(10)	70002
eq_3Q(Ga) [MHz]	-103.26(8)	70002	-65.07(20)	70002
eq_eQ(Ga) [MHz]	-107.07(8)	70002	-67.46(8)	70002
c_{Ga} [kHz]	+14(5)	70002		
μ_0 [D]	2.45(5)	70002		
μ_r [amu]	14.893275		14.984538	

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{69}Ga^{19}F$	1 – 0	3/2 – 3/2	0	21448.957	(0.02)	70002
	1 – 0	5/2 – 3/2	0	21475.627	(0.02)	70002
	1 – 0	1/2 – 3/2	0	21496.874	(0.02)	70002
	1 – 0	3/2 – 3/2	1	21278.657	(0.02)	70002
	1 – 0	5/2 – 3/2	1	21305.063	(0.02)	70002
	1 – 0	1/2 – 3/2	1	21326.060	(0.03)	70002
	1 – 0	3/2 – 3/2	2	21109.575	(0.02)	70002
	1 – 0	5/2 – 3/2	2	21135.705	(0.02)	70002
	1 – 0	1/2 – 3/2	2	21156.518	(0.02)	70002
	1 – 0	3/2 – 3/2	3	20941.725	(0.02)	70002
	1 – 0	5/2 – 3/2	3	20967.561	(0.02)	70002
	1 – 0	1/2 – 3/2	3	20988.173	(0.02)	70002
	2 – 1	3/2 – 1/2	0	42913.545	(0.03)	70002
	2 – 1	5/2 – 5/2	0	42915.785	(0.03)	70002
	2 – 1	1/2 – 1/2	0	42940.147	(0.03)	70002
	2 – 1	5/2 – 3/2	0	42942.484	(0.03)	70002
	2 – 1	7/2 – 5/2	0	42942.484	(0.03)	70002
	2 – 1	3/2 – 3/2	0	42961.445	(0.03)	70002
	2 – 1	5/2 – 3/2	1	42601.434	(0.04)	70002
	2 – 1	7/2 – 5/2	1	42601.434	(0.04)	70002
	2 – 1	5/2 – 3/2	2	42262.832	(0.04)	70002
	2 – 1	7/2 – 5/2	2	42262.832	(0.04)	70002
$^{71}Ga^{19}F$	1 – 0	3/2 – 3/2	0	21326.322	(0.02)	70002
	1 – 0	5/2 – 3/2	0	21343.148	(0.02)	70002
	1 – 0	1/2 – 3/2	0	21356.510	(0.02)	70002
	1 – 0	3/2 – 3/2	1	21157.493	(0.02)	70002
	1 – 0	5/2 – 3/2	1	21174.155	(0.02)	70002
	1 – 0	1/2 – 3/2	1	21187.373	(0.02)	70002
	1 – 0	3/2 – 3/2	2	20989.868	(0.03)	70002
	1 – 0	5/2 – 3/2	2	21006.363	(0.03)	70002
	1 – 0	1/2 – 3/2	2	21019.460	(0.03)	70002
	1 – 0	5/2 – 3/2	3	20839.742	(0.05)	70002
	2 – 1	3/2 – 1/2	0	42662.414	(0.05)	70002
	2 – 1	5/2 – 5/2	0	42663.805	(0.05)	70002
	2 – 1	1/2 – 1/2	0	42679.188	(0.05)	70002
	2 – 1	5/2 – 3/2	0	42680.665	(0.05)	70002
	2 – 1	7/2 – 5/2	0	42680.665	(0.05)	70002
	2 – 1	5/2 – 3/2	1	42342.680	(0.10)	70002
	2 – 1	7/2 – 5/2	1	42342.680	(0.10)	70002

FH

Hydrogen Fluoride

	$^{1}H^{19}F$		$^{2}H^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
B_0 [MHz]			325584.98(30)	71002
D_0 [MHz]			17.68(15)	65006
Y_{01} [MHz]	628236(27)	68028	329772(45)	65006
Y_{11} [MHz]	-23923(3)	68028	-8715(30)	65006
Y_{21} [MHz]	380(9)	68028		
Y_{31} [MHz]	-13.2(9)	68028		
Y_{02} [MHz]	-64.49(12)	68028		
Y_{12} [MHz]	2.04(12)	68028		
Y_{22} [kHz]	-87(5)	68028		
Y_{03} [kHz]	4.7(5)	68028		
Y_{10} [cm^{-1}]	4138.32(6)	68028		
Y_{20} [cm^{-1}]	-89.88(4)	68028		
$eq_0Q(H)$[kHz]			354.238(78)	70012
c_H [kHz]	-71.128(24)	70012	-5.755(19)	70012
c_F [kHz]	307.637(20)	70012	158.356(45)	70012
c_3 [kHz]	28.675(5)	70012	4.434(9)	70012
c_4 [kHz]	0.529(23)	70012		
μ_0 [D]	1.826526(7)	70012		
g_J [μ_n]	0.74104(15)	73004		
μ_r [amu]	0.95705545		1.8210454	

Additional references: 68029, 66009, 61000, 1150a.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^2H^{19}F$	1 – 0		0	651099.393	(0.10)	70007

FI

Iodine Fluoride

$^{127}I^{19}F$		
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	8385.520(30)	73011
Y_{11} [MHz]	-56.163(50)	73011
Y_{21} [MHz]	-0.080(20)	73011
Y_{02} [kHz]	-7.095(20)	73011
$eq_0Q(I)$ [MHz]	-3438.15(20)	73011
$eq_1Q(I)$ [MHz]	-3432.68(25)	73011
c_I [kHz]	+90(10)	73011
μ_r [amu]	16.5245715	

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{127}I^{19}F$	1 – 0	5/2 – 5/2	0	16170.005	(0.04)	73011
	1 – 0	7/2 – 5/2	0	16891.132	(0.04)	73011
	1 – 0	3/2 – 5/2	0	17203.373	(0.04)	73011
	2 – 1	5/2 – 3/2	0	32710.379	(0.08)	73011
	2 – 1	7/2 – 7/2	0	32841.364	(0.04)	73011
	2 – 1	5/2 – 7/2	0	33022.650	(0.08)	73011
	2 – 1	3/2 – 3/2	0	33194.004	(0.04)	73011
	2 – 1	9/2 – 7/2	0	33504.918	(0.04)	73011
	2 – 1	7/2 – 5/2	0	33562.583	(0.04)	73011
	2 – 1	3/2 – 1/2	0	33636.237	(0.08)	73011
	2 – 1	5/2 – 5/2	0	33743.725	(0.04)	73011
	2 – 1	3/2 – 5/2	0	34227.341	(0.08)	73011
	2 – 1	5/2 – 3/2	1	32486.253	(0.08)	73011
	2 – 1	7/2 – 7/2	1	32617.092	(0.08)	73011
	2 – 1	5/2 – 7/2	1	32798.092	(0.08)	73011
	2 – 1	3/2 – 3/2	1	32969.043	(0.08)	73011
	2 – 1	9/2 – 7/2	1	33279.545	(0.04)	73011
	2 – 1	7/2 – 5/2	1	33337.071	(0.04)	73011
	2 – 1	1/2 – 3/2	1	33410.558	(0.08)	73011
	2 – 1	5/2 – 5/2	1	33518.038	(0.04)	73011
	2 – 1	3/2 – 5/2	1	34000.840	(0.08)	73011
	2 – 1	9/2 – 7/2	2	33053.463	(0.08)	73011

FIn

Indium Monofluoride

	$^{115}In^{19}F$		$^{113}In^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	7864.279(5)	70002	7884.042(6)	70002
Y_{11} [MHz]	-56.354(5)	70002	-56.567(6)	70002
Y_{21} [MHz]	0.149(5)	70002	0.150(6)	70002
Y_{02} [kHz]	-7.5(4)	70002	-7.5(5)	70002
$eq_0Q(In)$ [MHz]	-723.74(15)	70002	-713.79(20)	70002
$eq_1Q(In)$ [MHz]	-717.10(15)	70002		
$eq_2Q(In)$ [MHz]	-710.46(15)	70002		
$eq_3Q(In)$ [MHz]	-703.81(20)	70002		
$eq_eQ(In)$ [MHz]	-727.06(20)	70002		
J=1				
$eq_0Q(In)$ [MHz]	-723.7996(2)	72013		
$eq_1Q(In)$ [MHz]	-717.115(50)	72013		
$eq_2Q(In)$ [MHz]	-710.490(50)	72013		
J=2				
$eq_0Q(In)$ [MHz]	-723.7896(2)	72013		
$eq_1Q(In)$ [MHz]	-717.062(5)	72013		
c_{In} [kHz]	+17(4)	70002	17(6)	70002
c_{In} [kHz]	+17.50(1)	72013		
c_F [kHz]	18.77(10)	72013		
c_3 [kHz]	2.62(3)	72013		
c_4 [kHz]	-2.13(3)	72013		
μ_0 [D]	3.40(7)	70002		
μ_r [amu]	16.302861		16.261994	

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{19}F$	1 – 0	9/2 – 9/2	0	15575.879	(0.02)	70002
	1 – 0	11/2 – 9/2	0	15708.668	(0.02)	70002
	1 – 0	7/2 – 9/2	0	15738.701	(0.02)	70002
	1 – 0	9/2 – 9/2	1	15464.654	(0.02)	70002
	1 – 0	11/2 – 9/2	1	15596.218	(0.02)	70002
	1 – 0	7/2 – 9/2	1	15625.980	(0.02)	70002
	1 – 0	9/2 – 9/2	2	15354.011	(0.02)	70002
	1 – 0	11/2 – 9/2	2	15484.366	(0.02)	70002
	1 – 0	7/2 – 9/2	2	15513.847	(0.02)	70002
	1 – 0	9/2 – 9/2	3	15243.981	(0.02)	70002
	1 – 0	11/2 – 9/2	3	15373.100	(0.02)	70002
	1 – 0	7/2 – 9/2	3	15402.330	(0.02)	70002
	2 – 1	9/2 – 7/2	0	31217.97	(0.10)	69008
	2 – 1	9/2 – 11/2	0	31247.84	(0.10)	69008
	2 – 1	11/2 – 11/2	0	31247.84	(0.10)	69008
	2 – 1	7/2 – 7/2	0	31282.21	(0.10)	69008
	2 – 1	13/2 – 11/2	0	31359.93	(0.10)	69008
	2 – 1	5/2 – 7/2	0	31372.70	(0.10)	69008
	2 – 1	9/2 – 9/2	0	31380.64	(0.10)	69008
	2 – 1	11/2 – 9/2	0	31380.64	(0.10)	69008
	2 – 1	7/2 – 9/2	0	31445.09	(0.10)	69008
	2 – 1	9/2 – 11/2	1	31024.48	(0.10)	69008
	2 – 1	11/2 – 11/2	1	31024.48	(0.10)	69008
	2 – 1	7/2 – 7/2	1	31058.40	(0.10)	69008
	2 – 1	13/2 – 11/2	1	31135.62	(0.10)	69008
	2 – 1	5/2 – 7/2	1	31148.26	(0.10)	69008
	2 – 1	9/2 – 9/2	1	31156.14	(0.10)	69008
	2 – 1	11/2 – 9/2	1	31156.14	(0.10)	69008
	3 – 2	15/2 – 13/2	0	47024.75	(0.10)	69008
	3 – 2	9/2 – 9/2	0	47031.97	(0.10)	69008
	3 – 2	9/2 – 11/2	0	47031.97	(0.10)	69008
	3 – 2	3/2 – 5/2	0	47031.97	(0.10)	69008
	3 – 2	13/2 – 11/2	0	47036.19	(0.10)	69008
$^{113}In^{19}F$	1 – 0	9/2 – 9/2	0	15616.498	(0.03)	70002
	1 – 0	11/2 – 9/2	0	15747.428	(0.03)	70002
	1 – 0	7/2 – 9/2	0	15777.109	(0.03)	70002

FK

Potassium Fluoride

	$^{39}K^{19}F$		$^{41}K^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	8392.3125(8)	72019	8258.1298(10)	a
Y_{11} [MHz]	-70.0027(8)	72019	-68.3305(8)	a
Y_{21} [MHz]	0.20874(30)	72019	0.20212(30)	a
Y_{02} [kHz]	-14.493(16)	1404	-14.033(16)	a
$eq_0Q(K)$ [MHz]	-7.93387(80)	1711	-9.6569(6)	67002
$eq_1Q(K)$ [MHz]	-7.83773(90)	1711		
$eq_2Q(K)$ [MHz]	-7.74280(90)	1711		
$eq_3Q(K)$ [MHz]	-7.64953(90)	1711		
$eq_4Q(K)$ [MHz]	-7.55661(90)	1711		
$eq_5Q(K)$ [MHz]	-7.46499(90)	1711		
$eq_eQ(K)$ [MHz]	-7.98218(160)	1711		
c_K [kHz]	0.35(8)	1711		
c_F [kHz]	10.69(7)	1711		
c_3 [kHz]	0.42(6)	1711		
c_4 [kHz]	0.06(20)	1711		
μ_0 [D]	8.59260(80)	1710	8.59248(80)	1710
μ_1 [D]	8.66151(80)	1710		
μ_2 [D]	8.73093(80)	1710		
μ_3 [D]	8.80090(80)	1710		
μ_4 [D]	8.87138(80)	1710		
μ_5 [D]	8.94232(80)	1710		
μ_e [D]	8.55832(80)	1710		
μ_r [amu]	12.7712442		12.3787584	

[a]Calculated with isotopic relations from isotope $^{39}K^{19}F$.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{39}K^{19}F$	1 − 0	3/2 − 3/2	0	16713.083	(0.01)	60000
	1 − 0	5/2 − 3/2	0	16715.067	(0.01)	60000
	1 − 0	1 , 1/2 − 2 , 3/2	0	16716.650	(0.01)	72019
	1 − 0	3/2 − 3/2	1	16573.936	(0.01)	60000
	1 − 0	5/2 − 3/2	1	16575.897	(0.01)	60000
	1 − 0	1 , 1/2 − 2 , 3/2	1	16577.456	(0.01)	72019
	1 − 0	3/2 − 3/2	2	16435.599	(0.01)	60000
	1 − 0	5/2 − 3/2	2	16437.542	(0.01)	60000
	1 − 0	1 , 1/2 − 2 , 3/2	2	16439.096	(0.01)	72019
	2 − 1	2 , 3/2 − 1 , 1/2	0	33427.017	(0.01)	72019
	2 − 1	1 , 1/2 − 1 , 1/2	0	33428.997	(0.01)	72019
	2 − 1	0 , 1/2 − 1 , 1/2	0	33428.977	(0.01)	72019
	2 − 1	2 , 3/2 − 1 , 1/2	1	33148.699	(0.01)	72019
	2 − 1	1 , 1/2 − 1 , 1/2	1	33150.656	(0.01)	72019
	2 − 1	0 , 1/2 − 1 , 1/2	1	33150.637	(0.01)	72019
	2 − 1	2 , 3/2 − 1 , 1/2	2	32872.052	(0.01)	72019
	2 − 1	1 , 1/2 − 1 , 1/2	2	32873.985	(0.01)	72019
	6 − 5		0	100275.855	(0.10)	1404
	6 − 5		1	99440.820	(0.10)	1404
	6 − 5		2	98610.756	(0.10)	1404
	7 − 6		0	116983.272	(0.10)	1404
	7 − 6		1	116009.004	(0.10)	1404
	7 − 6		2	115040.649	(0.10)	1404
	8 − 7		0	133688.188	(0.10)	1404
	8 − 7		1	132574.884	(0.10)	1404
	9 − 8		0	150390.286	(0.10)	1404
	10 − 9		0	167089.325	(0.10)	1404
	10 − 9		1	165697.625	(0.10)	1404
	11 − 10		0	183784.847	(0.10)	1404
	12 − 11		0	200476.632	(0.10)	1404
	14 − 13		0	233847.180	(0.10)	1404

FLi
Lithium Fluoride

	$^{6}Li^{19}F$		$^{7}Li^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	45230.848(13)	69004	40329.808(14)	69004
Y_{11} [MHz]	-722.417(28)	69004	-608.182(29)	69004
Y_{21} [MHz]	5.918(16)	69004	4.670(17)	69004
Y_{31} [kHz]	-21.2(28)	69004	-10.4(28)	69004
Y_{02} [kHz]	-442.95(16)	69004	-352.36(17)	69004
Y_{12} [kHz]	4.81(12)	69004	3.73(9)	69004
$eq_0Q(Li)$ [kHz]	8.5(8)	66001	415.6(4)	66001
$eq_1Q(Li)$ [kHz]	8.6(12)	66001	406.1(6)	66001
$eq_2Q(Li)$ [kHz]	7.1(20)	66001	396.5(8)	66001
$eq_eQ(Li)$ [kHz]			420.3(8)	66001
c_{Li} [kHz]	0.71(8)	66001	1.87(3)	66001
c_F [kHz]	36.8(4)	66001	32.7(2)	66001
c_3 [kHz]	4.307(80)	66001	11.382(20)	66001
c_4 [kHz]	0.0(2)	66001	0.0(1)	66001
μ_0 [D]	6.32736(20)	68000	6.3248(10)	68000
μ_1 [D]	6.41472(20)	68000	6.4072(10)	68000
μ_2 [D]	6.50317(20)	68000	6.4905(10)	68000
μ_3 [D]	6.5333(10)	1153		
μ_e [D]	6.28409(25)	68000	6.2839(12)	68000
g_J [μ_n]	0.0818(5)	58001	0.0642(4)	58001
μ_r [amu]	4.5686377		5.1238103	

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^6Li^{19}F$	1 – 0		0	89740.465	(0.02)	1153
	1 – 0		1	88319.178	(0.02)	1153
	1 – 0		2	86921.199	(0.02)	1153
	1 – 0		3	85546.64	(0.02)	1153
	2 – 1		0	179470.35	(0.10)	69004
	2 – 1		1	176627.91	(0.10)	69004
	2 – 1		2	173832.04	(0.10)	69004
	2 – 1		3	171082.27	(0.10)	69004
	3 – 2		0	269179.18	(0.10)	69004
	3 – 2		1	264915.79	(0.10)	69004
	3 – 2		2	260722.24	(0.10)	69004
	3 – 2		3	256597.84	(0.10)	69004
	4 – 3		0	358856.19	(0.10)	69004
	4 – 3		1	353172.23	(0.10)	69004
	4 – 3		2	347581.39	(0.10)	69004
	4 – 3		3	342082.66	(0.10)	69004
	5 – 4		0	448491.07	(0.10)	69004
	5 – 4		1	441386.83	(0.10)	69004
	6 – 5		0	538072.65	(0.10)	69004
$^7Li^{19}F$	2 – 1		0	160096.33	(0.10)	69004
	2 – 1		1	157700.92	(0.10)	69004
	2 – 1		2	155342.51	(0.10)	69004
	2 – 1		3	153020.86	(0.10)	69004
	3 – 2		0	240123.47	(0.10)	69004
	3 – 2		1	236530.55	(0.10)	69004
	3 – 2		2	232993.30	(0.10)	69004
	3 – 2		3	229510.98	(0.10)	69004
	4 – 3		0	320125.36	(0.10)	69004
	4 – 3		1	315335.27	(0.10)	69004
	4 – 3		2	310619.23	(0.10)	69004
	4 – 3		3	305976.64	(0.10)	69004
	5 – 4		0	400095.62	(0.10)	69004
	5 – 4		1	394106.70	(0.10)	69004
	5 – 4		2	388212.19	(0.10)	69004
	5 – 4		3	382409.64	(0.10)	69004
	6 – 5		0	480019.73	(0.10)	69004
	6 – 5		1	472836.69	(0.10)	69004

FNa

Sodium Fluoride

$^{23}Na^{19}F$		
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	13097.971(3)	63001
Y_{11} [MHz]	-136.665(5)	63001
Y_{21} [MHz]	0.700(1)	63001
Y_{02} [kHz]	-34.79(5)	a
$eq_0Q(Na)$ [MHz]	-8.4401(15)	1188
$eq_1Q(Na)$ [MHz]	-8.3279(15)	1188
$eq_2Q(Na)$ [MHz]	-8.2205(20)	1188
$eq_eQ(Na)$ [MHz]	-8.4980(26)	1188
c_{Na} [kHz]	1.4(5)	1188
c_F [kHz]	2.0(3)	1188
c_3 [kHz]	3.85(25)	1188
μ_0 [D]	8.1558(10)	1188
μ_1 [D]	8.2209(10)	1188
μ_2 [D]	8.2867(10)	1188
μ_e [D]	8.1235(15)	1188
g_J [μ_n]	-0.00536(6)	1306
μ_r [amu]	10.4021896	

[a]Recalculated from data in Ref. 63001 and 1404. The value of Y_{12} can not be determined.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F₁″	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{23}Na^{19}F$	1 – 0	3/2 – 3/2	0	26057.799	(0.01)	63001
	1 – 0	5/2 – 3/2	0	26059.912	(0.01)	63001
	1 – 0	1/2 – 3/2	0	26061.592	(0.01)	63001
	1 – 0	3/2 – 3/2	1	25787.290	(0.01)	63001
	1 – 0	5/2 – 3/2	1	25789.377	(0.01)	63001
	1 – 0	1/2 – 3/2	1	25791.036	(0.01)	63001
	1 – 0	3/2 – 3/2	2	25519.582	(0.01)	63001
	1 – 0	5/2 – 3/2	2	25521.642	(0.01)	63001
	1 – 0	1/2 – 3/2	2	25523.281	(0.01)	63001
	4 – 3		0	104229.592	(0.10)	1404
	4 – 3		1	103147.626	(0.10)	1404
	4 – 3		2	102076.572	(0.10)	1404
	5 – 4		0	130280.736	(0.10)	1404
	5 – 4		1	128928.204	(0.10)	1404
	6 – 5		0	156327.692	(0.10)	1404
	6 – 5		1	154704.784	(0.10)	1404
	7 – 6		0	182369.675	(0.10)	1404
	7 – 6		1	180476.177	(0.10)	1404
	10 – 9		0	260457.106	(0.10)	1404

FRb

Rubidium Fluoride

	$^{85}Rb^{19}F$		$^{87}Rb^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	6315.543(9)	58000	6289.002(10)	58000
Y_{11} [MHz]	-45.638(15)	58000	-45.350(15)	58000
Y_{21} [MHz]	0.094(7)	58000	0.094(7)	58000
Y_{02} [kHz]	-8.045(6)	1404	-7.926(8)	1404
$eq_0Q(Rb)$ [MHz]	-70.341(1)	a	-34.031(2)	67002
$eq_1Q(Rb)$ [MHz]	-69.555(3)	66002	-33.684(4)	67004
$eq_2Q(Rb)$ [MHz]	-68.779(3)	66002	-33.336(4)	67004
$eq_3Q(Rb)$ [MHz]	-68.013(5)	66002		
$eq_4Q(Rb)$ [MHz]	-67.259(7)	66002		
$eq_eQ(Rb)$ [MHz]	-70.739(5)	66002	-34.212(5)	67004
c_{Rb} [kHz]	+0.525(20)	a	+1.60(10)	67002
c_F [kHz]	+10.57(10)	a	+10.51(10)	67002
c_3 [kHz]	+0.86(10)	a	+3.16(30)	67002
c_4 [kHz]	+0.19(6)	a	+0.66(15)	67002
μ_0 [D]	8.5465(5)	68000		
μ_1 [D]	8.6134(7)	68000		
μ_2 [D]	8.6809(9)	68000		
μ_e [D]	8.5131(7)	68000		
g_J [μ_n]	-0.05471(4)	1619		
μ_r [amu]	15.5248345		15.5903451	

[a]Mean value of Ref. 66002 and Ref. 67002, since all measurements agree within their error limits.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{85}Rb^{19}F$	1 – 0	5/2 – 5/2	0	12574.214	(0.01)	58000
	1 – 0	7/2 – 5/2	0	12588.985	(0.01)	58000
	1 – 0	3/2 – 5/2	0	12595.316	(0.01)	58000
	1 – 0	5/2 – 5/2	1	12483.444	(0.01)	58000
	1 – 0	7/2 – 5/2	1	12498.054	(0.01)	58000
	1 – 0	3/2 – 5/2	1	12504.307	(0.01)	58000
	1 – 0	5/2 – 5/2	2	12393.058	(0.01)	58000
	8 – 7		0	100667.499	(0.10)	1404
	8 – 7		1	99940.248	(0.10)	1404
	9 – 8		0	113246.036	(0.10)	1404
	9 – 8		1	112427.805	(0.10)	1404
	11 – 10		0	138397.632	(0.10)	1404
	15 – 14		0	188673.835	(0.10)	1404
	15 – 14		1	187310.440	(0.10)	1404
	15 – 14		2	185952.825	(0.10)	1404
	16 – 15		0	201236.076	(0.10)	1404
	16 – 15		1	199781.736	(0.10)	1404
	18 – 17		0	226351.230	(0.10)	1404
	18 – 17		1	224715.192	(0.10)	1404
	21 – 20		0	263997.503	(0.10)	1404
	24 – 23		0	301607.144	(0.10)	1404
$^{87}Rb^{19}F$	1 – 0	3/2 – 3/2	0	12525.870	(0.01)	58000
	1 – 0	5/2 – 3/2	0	12534.381	(0.01)	58000
	1 – 0	1/2 – 3/2	0	12541.181	(0.01)	58000
	9 – 8		0	112771.005	(0.10)	1404
	9 – 8		1	111958.326	(0.10)	1404
	14 – 13		0	175370.290	(0.10)	1404
	15 – 14		0	187882.995	(0.10)	1404
	15 – 14		1	186528.030	(0.10)	1404
	15 – 14		2	185179.055	(0.10)	1404
	16 – 15		0	200392.716	(0.10)	1404
	18 – 17		0	225402.840	(0.10)	1404
	18 – 17		1	223776.564	(0.10)	1404

FS

Sulfur Monofluoride

$^{32}S^{19}F$		
Constant	Value (Unc.)	Ref.
B_{02} [MHz]	16553.760(52)	73003
a+(b+c)/2 [MHz]	428.60(71)	73003
μ_0 [D]	0.794(12)	73003
A [cm^{-1}]	-387(25)	69046
μ_r [amu]	11.9170627	

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Parity	Ref.
$^{32}S^{19}F$ $^2\Pi_{3/2}$	5/2 – 3/2	2 – 2	0	82511.60	(0.10)		73003
	5/2 – 3/2	2 – 1	0	82584.45	(0.10)		73003
	5/2 – 3/2	3 – 2	0	82732.17	(0.10)		73003

FTl

Thallium Fluoride

	$^{205}Tl^{19}F$		$^{203}Tl^{19}F$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	6689.8736(2)	72019	6695.467(3)	1374
Y_{11} [MHz]	-45.0843(3)	72019	-45.139(5)	1374
Y_{21} [MHz]	0.0942(1)	72019	0.094(2)	1374
Y_{02} [kHz]	-5.84(2)	72019	-5.94(2)	b
c_{Tl} [kHz]	126.03(12)	64000		
c_F [kHz]	17.89(15)	64000		
c_3 [kHz]	3.50(15)	64000		
c_4 [kHz]	-13.30(72)	64000		
μ_0 [D]	4.2282(8)	64000		
μ_1 [D]	4.2972(10)	64000		
μ_2 [D]	4.3665(11)	64000		
μ_e [D]	4.1939(10)	a		
g_J [μ_n]	-0.053556(72)	a		
μ_r [amu]	17.3868727		17.3723373	

[a] Calculated from Ref. 64000.

[b] Determined from the value for ^{205}TlF by isotope relations.

Additional references: 509, 213, 530, 70002

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{205}Tl^{19}F$	1 – 0	1/2 – 1/2	0	13334.590	(0.01)	1374
	1 – 0	3/2 – 1/2	0	13334.750	(0.01)	72019
	1 – 0	1/2 – 1/2	1	13244.768	(0.01)	1374
	1 – 0	3/2 – 1/2	1	13244.968	(0.01)	72019
	1 – 0	1/2 – 1/2	2	13155.354	(0.01)	1374
	1 – 0	3/2 – 1/2	2	13155.552	(0.01)	72019
	2 – 1	3/2 – 3/2	0	26668.948	(0.01)	72019
	2 – 1	5/2 – 3/2	0	26669.305	(0.01)	72019
	2 – 1	5/2 – 3/2	1	26489.723	(0.01)	72019
	2 – 1	5/2 – 3/2	2	26310.892	(0.01)	72019
	2 – 1		3	26132.798	(0.03)	70002
	2 – 1		4	25955.484	(0.04)	70002
	3 – 2		0	40003.566	(0.05)	70002
	3 – 2		1	39734.153	(0.05)	70002
	3 – 2		2	39465.891	(0.07)	70002
	3 – 2		3	39198.741	(0.07)	70002
	4 – 3		0	53337.445	(0.06)	70002
	4 – 3		1	52978.272	(0.06)	70002
	4 – 3		2	52620.521	(0.06)	70002
	4 – 3		3	52264.345	(0.08)	70002
	4 – 3		4	51909.743	(0.08)	70002
	4 – 3		5	51556.768	(0.10)	70002
$^{203}Tl^{19}F$	1 – 0	1/2 – 1/2	0	13345.693	(0.01)	1374

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{203}Tl^{19}F$	1 – 0	3/2 – 1/2	0	13345.880	(0.01)	1374
	1 – 0	1/2 – 1/2	1	13255.794	(0.01)	1374
	1 – 0	3/2 – 1/2	1	13255.977	(0.01)	1374
	1 – 0	1/2 – 1/2	2	13166.269	(0.01)	1374
	1 – 0	3/2 – 1/2	2	13166.452	(0.01)	1374
	2 – 1		0	26691.513	(0.03)	70002
	2 – 1		1	26511.717	(0.03)	70002
	2 – 1		2	26332.656	(0.03)	70002
	2 – 1		3	26154.362	(0.03)	70002
	2 – 1		4	25976.819	(0.04)	70002
	3 – 2		0	40036.903	(0.05)	70002
	3 – 2		1	39767.257	(0.05)	70002
	3 – 2		2	39498.599	(0.07)	70002
	4 – 3		0	53381.902	(0.06)	70002
	4 – 3		1	53022.347	(0.06)	70002
	4 – 3		2	52664.255	(0.08)	70002
	4 – 3		3	52307.631	(0.08)	70002

GaI

Gallium Iodide

	$^{69}Ga^{127}I$		$^{69}Ga^{127}I$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	1706.868(40)	a	1675.691(40)	b
Y_{11} [MHz]	-5.671(30)	a	-5.536(40)	a
Y_{02} [kHz]	-0.47(X)	509		
$eq_0Q(Ga)$ [MHz]	-79(20)	a		
$eq_0Q(I)$ [MHz]	-399(20)	a		
μ_r [amu]	44.6660984		45.497142	

[a] Recalculation from the frequency measurements in Ref. 509.

[b] Calculated from isotope $^{69}Ga^{127}I$.

Additional References: 318

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{69}Ga^{127}I$	7 – 6	6 , 13/2 – 5 , 11/2	0	23851.47	(0.20)	509
	7 – 6	6 , 9/2 – 5 , 7/2	0	23853.25	(0.50)	509
	7 – 6	8 , 15/2 – 7 , 13/2	0	23855.66	(0.20)	509
	7 – 6	11 , 19/2 – 10 , 17/2	0	23857.29	(0.20)	509
	7 – 6	11 , 19/2 – 10 , 17/2	1	23778.29	(0.20)	509
	7 – 6	11 , 19/2 – 10 , 17/2	2	23698.78	(0.50)	509
$^{71}Ga^{127}I$	7 – 6	11 , 19/2 – 10 , 17/2	0	23421.95	(0.20)	509
	7 – 6	11 , 19/2 – 10 , 17/2	1	23344.45	(0.50)	509

GeO

Germanium Monoxide

	$^{70}Ge^{16}O$	$^{72}Ge^{16}O$	^{73}GeO	$^{74}Ge^{16}O$	$^{76}Ge^{16}O$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
B_0 [MHz]	14662.043(15)	14586.368(15)	14549.989(10)	14514.703(15)	14446.788(15)	1563
Y_{01} [MHz]	14708.858(20)	14632.820(20)	14596.260(20)	14560.805(20)	14492.573(20)	1563
Y_{11} [MHz]	-93.630(21)	-92.905(21)	-92.542(21)	-92.205(21)	-91.570(21)	1563
Y_{02} [kHz]	-14[a]	-14[a]	-14[a]	-14[a]	-14[a]	1563
$eq_0Q(Ge)$ [MHz]			208.33(19)			1563
c_{Ge} [kHz]			-10(5)			1563
μ_0 [D]	3.28243(30)	3.28235(30)		3.28238(30)	3.28239(30)	70013
μ_1 [D]				3.30323(30)		70013
μ_2 [D]				3.32393(30)		70013
μ_e [D]				3.2720(3)		70013
$\|g_J\|v=0[\mu_n]$	0.14179(5)	0.14134(6)		0.14089(5)		70015
$\|g_J\|v=1[\mu_n]$	0.14254(6)	0.14208(6)		0.14164(6)		70015
μ_r [amu]	13.017264	13.084928	13.117700	13.149626	13.211543	

[a]Calculated from $Y_{02} = -4B_e^3/\omega_e$ where $\omega_e = 985.5\ cm^{-1}$ from G. Drummond and R. F. Barrow, Proc. Phys. Soc. (London) 65A, 277 (1952).

Isotopic Species	J' ← J''	F' F$_1$' ← F'' F$_1$''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{70}Ge^{16}O$	1 – 0		0	29324.03	(0.03)	1563
	1 – 0		1	29136.77	(0.03)	1563
$^{72}Ge^{16}O$	1 – 0		0	29172.68	(0.03)	1563
	1 – 0		1	28986.87	(0.03)	1563
$^{73}Ge^{16}O$	1 – 0	7/2 – 9/2	0	29080.88	(0.03)	1563
	1 – 0	11/2 – 9/2	0	29089.46	(0.03)	1563
	1 – 0	9/2 – 9/2	0	29127.71	(0.03)	1563
$^{74}Ge^{16}O$	1 – 0		0	29029.35	(0.03)	1563
	1 – 0		1	28844.94	(0.03)	1563
$^{76}Ge^{16}O$	1 – 0		0	28893.53	(0.03)	1563
	1 – 0		1	28710.38	(0.03)	1563

GeS

Germanium Monosulfide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{70}Ge^{32}S$	21.9401758	5689.6299(22)	-23.0408(19)	-1.96(45)	-2.49(11)	a
$^{72}Ge^{32}S$	22.1330839	5640.0401(22)	-22.7402(19)	-1.92(45)	-2.45(11)	a
$^{73}Ge^{32}S$	22.2270115	5616.2062(22)	-22.5962(19)	-1.91(45)	-2.43(11)	a
$^{74}Ge^{32}S$	22.3188284	5593.1019(22)	-22.4569(19)	-1.89(45)	-2.41(11)	69009
$^{76}Ge^{32}S$	22.4977888	5548.6111(22)	-22.1895(19)	-1.86(45)	-2.37(11)	a
$^{70}Ge^{34}S$	22.8619636	5460.2257(22)	-21.6614(19)	-1.80(45)	-2.30(11)	a
$^{72}Ge^{34}S$	23.0714992	5410.6359(22)	-21.3670(19)	-1.77(45)	-2.26(11)	a
$^{74}Ge^{34}S$	23.2734001	5363.6977(22)	-21.0895(19)	-1.74(45)	-2.22(11)	a
$^{74}Ge^{33}S$	22.8012814	5474.7572(40)	-21.7479(21)	-1.81(45)	-2.26(11)	a

Constant	$^{73}Ge^{32}S$ Value (Unc.)	$^{74}Ge^{33}S$ Value (Unc.)	$^{74}Ge^{32}S$ Value (Unc.)
$eq_0Q(S)$[MHz]		6.96(30)	
$eq_0Q(Ge)$[MHz]	187.76(12)		
$eq_1Q(Ge)$[MHz]	186.72(19)		
c_{Ge} [kHz]	-0.8(6)		
μ_0[D]			2.00(6)
Ref.	70041	70041	69009

[a]Calculated with isotopic relations from $^{74}Ge^{32}S$.

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{70}Ge^{32}S$	1 – 0		0	11356.200	(0.02)	69009
	1 – 0		1	11310.130	(0.02)	69009
	1 – 0		2	11264.028	(0.02)	69009
	2 – 1		0	22712.335	(0.02)	69009
	2 – 1		1	22620.166	(0.02)	69009
	2 – 1		2	22527.978	(0.02)	69009
	2 – 1		4	22343.525	(0.03)	69009
	3 – 2		0	34068.368	(0.02)	69009
	3 – 2		1	33930.125	(0.04)	69009
	3 – 2		2	33791.77	(0.10)	1312
$^{72}Ge^{32}S$	1 – 0		0	11257.343	(0.02)	69009
	1 – 0		1	11211.853	(0.02)	69009
	1 – 0		2	11166.350	(0.02)	69009
	1 – 0		3	11120.863	(0.02)	69009
	2 – 1		0	22514.583	(0.02)	69009
	2 – 1		1	22423.630	(0.02)	69009
	2 – 1		2	22332.619	(0.02)	69009
	2 – 1		3	22241.628	(0.02)	69009
	2 – 1		4	22150.600	(0.03)	69009
	3 – 2		0	33771.777	(0.02)	69009
	3 – 2		1	33635.300	(0.03)	69009
	3 – 2		2	33498.74	(0.10)	1312

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{73}Ge^{32}S$	1 – 0	7/2 – 9/2	0	11192.630	(0.02)	70041
	1 – 0	11/2 – 9/2	0	11200.410	(0.02)	70041
	1 – 0	9/2 – 9/2	0	11234.855	(0.02)	70041
	1 – 0	7/2 – 9/2	1	11147.535	(0.02)	70041
	1 – 0	11/2 – 9/2	1	11155.283	(0.02)	70041
	1 – 0	9/2 – 9/2	1	11189.530	(0.02)	70041
	2 – 1	7/2 – 9/2	0	22393.413	(0.02)	70041
	2 – 1	11/2 – 9/2	0	22410.164	(0.02)	70041
	2 – 1	9/2 – 9/2	0	22410.164	(0.02)	70041
	2 – 1	5/2 – 7/2	0	22412.189	(0.02)	70041
	2 – 1	13/2 – 11/2	0	22415.515	(0.02)	70041
	2 – 1	7/2 – 7/2	0	22435.668	(0.02)	70041
	2 – 1	11/2 – 11/2	0	22444.608	(0.02)	70041
	2 – 1	9/2 – 11/2	0	22444.608	(0.02)	70041
	2 – 1	9/2 – 7/2	0	22452.419	(0.02)	70041
	2 – 1	7/2 – 9/2	1	22303.165	(0.05)	70041
	2 – 1	11/2 – 9/2	1	22319.830	(0.02)	70041
	2 – 1	9/2 – 9/2	1	22319.830	(0.02)	70041
	2 – 1	5/2 – 7/2	1	22321.840	(0.03)	70041
	2 – 1	13/2 – 11/2	1	22325.136	(0.02)	70041
	2 – 1	7/2 – 7/2	1	22345.135	(0.03)	70041
	2 – 1	9/2 – 7/2	1	22361.845	(0.05)	70041
$^{74}Ge^{32}S$	1 – 0		0	11163.743	(0.02)	69009
	1 – 0		1	11118.815	(0.02)	69009
	1 – 0		2	11073.890	(0.02)	69009
	1 – 0		3	11028.965	(0.02)	69009
	2 – 1		0	22327.412	(0.02)	69009
	2 – 1		1	22237.559	(0.02)	69009
	2 – 1		2	22147.717	(0.02)	69009
	2 – 1		3	22057.843	(0.02)	69009
	3 – 2		0	33490.982	(0.02)	69009
	3 – 2		1	33356.204	(0.02)	69009
	3 – 2		2	33221.51	(0.05)	1312
	3 – 2		3	33086.65	(0.05)	1312
$^{76}Ge^{32}S$	1 – 0		0	11075.030	(0.02)	69009
	1 – 0		1	11030.638	(0.02)	69009
	1 – 0		2	10986.258	(0.02)	69009
	2 – 1		0	22149.997	(0.02)	69009
	2 – 1		1	22061.210	(0.02)	69009
	2 – 1		2	21972.430	(0.02)	69009
	3 – 2		0	33224.859	(0.03)	69009
	3 – 2		1	33091.68	(0.10)	1312
	3 – 2		2	32958.54	(0.10)	1312
$^{70}Ge^{34}S$	1 – 0		0	10898.69	(0.10)	1312
	3 – 2		0	32696.13	(0.10)	1312
$^{72}Ge^{34}S$	1 – 0		0	10799.90	(0.10)	1312
	3 – 2		0	32399.50	(0.10)	1312
$^{74}Ge^{34}S$	1 – 0		0	10706.34	(0.10)	1312
	3 – 2		0	32118.65	(0.10)	1312
$^{74}Ge^{33}S$	1 – 0	5/2 – 3/2	0	10927.356	(0.04)	70041
	1 – 0	3/2 – 3/2	0	10929.097	(0.06)	70041

GeSe

Germanium Selenide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{70}Ge^{76}Se$	36.3993322	3047.0407(20)	-9.3933(25)	-0.4(8)	-0.574(45)	a
$^{70}Ge^{77}Se$	36.6277964	3028.0349(20)	-9.3055(25)	-0.4(8)	-0.567(45)	a
$^{70}Ge^{78}Se$	36.8523541	3009.5837(21)	-9.2206(27)	-0.4(9)	-0.560(45)	a
$^{72}Ge^{76}Se$	36.9333063	3002.9872(20)	-9.1903(25)	-0.4(8)	-0.558(45)	a
$^{72}Ge^{77}Se$	37.1685444	2983.9814(20)	-9.1032(25)	-0.4(8)	-0.551(45)	a
$^{70}Ge^{80}Se$	37.2936083	2973.9746(20)	-9.0575(26)	-0.4(9)	-0.547(43)	a
$^{72}Ge^{78}Se$	37.3998791	2965.5241(21)	-9.0189(26)	-0.4(9)	-0.544(44)	a
$^{74}Ge^{76}Se$	37.4534369	2961.2835(20)	-8.9995(25)	-0.4(8)	-0.542(45)	a
$^{74}Ge^{77}Se$	37.6953691	2942.2777(20)	-8.3130(25)	-0.4(8)	-0.535(41)	a
$^{70}Ge^{82}Se$	37.7235258	2940.0816(20)	-8.9031(25)	-0.4(8)	-0.535(41)	a
$^{72}Ge^{80}Se$	37.8544232	2929.9151(20)	-8.8569(26)	-0.4(9)	-0.531(42)	a
$^{74}Ge^{78}Se$	37.9333291	2923.8205(20)	-8.8293(25)	-0.4(9)	-0.529(43)	a
$^{73}Ge^{80}Se$	38.1300071	2908.7392(20)	-8.7611(25)	-0.4(9)	-0.523(41)	a
$^{72}Ge^{82}Se$	38.2973644	2896.0281(20)	-8.7037(25)	-0.4(8)	-0.519(41)	a
$^{74}Ge^{80}Se$	38.4010135	2888.2114(20)	-8.6685(25)	-0.4(8)	-0.516(41)	a
$^{76}Ge^{78}Se$	38.4532047	2884.2913(20)	-8.6509(25)	-0.4(8)	-0.515(41)	a
$^{74}Ge^{82}Se$	38.856916	2854.3244(20)	-8.5164(25)	-0.4(9)	-0.504(40)	a
$^{76}Ge^{80}Se$	38.9338773	2848.6822(20)	-8.4911(25)	-0.4(8)	-0.502(41)	a

Dipole Moment ($^{74}Ge^{80}Se$)			Hyperfine Structure ($^{73}Ge^{80}Se$)		
μ_0[D]	1.648(50)	[70014]	eq_0Q(Ge)[MHz]	172.40(25)	[70041]

[a] Recalculation of the data from Ref. 1496 whereby all measured species were fit simultaneously through the use of the isotopic relations.

Isotopic Species	J'	← J''	F'	F_1'	← F''	F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{70}Ge^{76}Se$	2	– 1					0	12169.35	(0.06)	1496
	2	– 1					1	12131.76	(0.06)	1496
$^{70}Ge^{77}Se$	2	– 1					0	12093.49	(0.06)	1496
	2	– 1					1	12056.27	(0.06)	1496
	4	– 3					0	24186.91	(0.06)	1496
$^{70}Ge^{78}Se$	2	– 1					0	12019.85	(0.03)	1496
	2	– 1					1	11982.98	(0.06)	1496
	2	– 1					2	11946.12	(0.06)	1496
	4	– 3					0	24039.62	(0.03)	1496
	4	– 3					1	23965.84	(0.06)	1496
$^{72}Ge^{76}Se$	2	– 1					0	11993.52	(0.06)	1496
	2	– 1					1	11956.80	(0.06)	1496
	4	– 3					0	23986.94	(0.06)	1496
$^{72}Ge^{77}Se$	2	– 1					0	11917.68	(0.06)	1496
	2	– 1					1	11881.24	(0.06)	1496
	4	– 3					0	23835.28	(0.06)	1496
$^{70}Ge^{80}Se$	2	– 1					0	11877.75	(0.03)	1496
	2	– 1					1	11841.54	(0.03)	1496
	2	– 1					2	11805.31	(0.06)	1496
	4	– 3					0	23755.40	(0.03)	1496
	4	– 3					1	23682.98	(0.03)	1496
	4	– 3					2	23610.47	(0.06)	1496
$^{72}Ge^{78}Se$	2	– 1					0	11844.05	(0.03)	1496
	2	– 1					1	11807.96	(0.03)	1496
	2	– 1					2	11771.86	(0.06)	1496
	4	– 3					0	23687.99	(0.03)	1496
	4	– 3					1	23615.78	(0.03)	1496
	5	– 4					0	29609.87	(0.06)	1496
$^{74}Ge^{76}Se$	2	– 1					0	11827.10	(0.06)	1496
	2	– 1					1	11791.11	(0.06)	1496
	4	– 3					0	23654.11	(0.06)	1496
	4	– 3					1	23582.11	(0.06)	1496
$^{74}Ge^{77}Se$	4	– 3					0	23502.41	(0.06)	1496
	4	– 3					1	23431.16	(0.06)	1496
$^{70}Ge^{82}Se$	2	– 1					0	11742.51	(0.06)	1496
	2	– 1					1	11706.93	(0.06)	1496
	4	– 3					0	23484.92	(0.06)	1496
$^{72}Ge^{80}Se$	2	– 1					0	11701.95	(0.03)	1496
	2	– 1					1	11666.52	(0.03)	1496
	2	– 1					2	11631.03	(0.06)	1496
	2	– 1					3	11595.58	(0.06)	1496
	3	– 2					0	17552.85	(0.03)	1496
	3	– 2					1	17499.76	(0.03)	1496
	4	– 3					0	23403.78	(0.03)	1496
	4	– 3					1	23332.86	(0.03)	1496
	4	– 3					2	23262.01	(0.06)	1496
$^{74}Ge^{78}Se$	2	– 1					0	11677.60	(0.03)	1496
	2	– 1					1	11642.27	(0.03)	1496
	2	– 1					2	11606.93	(0.06)	1496
	3	– 2					0	17516.43	(0.03)	1496
	4	– 3					0	23355.07	(0.03)	1496
	4	– 3					1	23284.47	(0.03)	1496
	4	– 3					2	23213.75	(0.06)	1496
$^{73}Ge^{80}Se$	2	– 1		7/2	–	9/2	0	11593.458	(0.05)	70041
	2	– 1		9/2	–	9/2	0	11608.865	(0.03)	70041
	2	– 1		11/2	–	9/2	0	11608.865	(0.03)	70041
	2	– 1		5/2	–	7/2	0	11610.635	(0.03)	70041
	2	– 1		13/2	–	11/2	0	11613.770	(0.02)	70041
	2	– 1		7/2	–	7/2	0	11632.195	(0.03)	70041
	2	– 1		11/2	–	11/2	0	11640.400	(0.03)	70041
	2	– 1		9/2	–	11/2	0	11640.400	(0.03)	70041
$^{72}Ge^{82}Se$	2	– 1					0	11566.67	(0.06)	1496
	4	– 3					0	23133.27	(0.06)	1496
	4	– 3					1	23063.68	(0.06)	1496
$^{74}Ge^{80}Se$	2	– 1					0	11535.517	(0.02)	70014
	2	– 1					1	11500.83	(0.02)	1496
	2	– 1					2	11466.16	(0.06)	1496
	2	– 1					3	11431.46	(0.06)	1496
	3	– 2					0	17303.25	(0.03)	1496
	4	– 3					0	23070.88	(0.03)	1496
	4	– 3					1	23001.56	(0.03)	1496
	4	– 3					2	22932.18	(0.06)	1496
	4	– 3					3	22862.84	(0.06)	1496
	5	– 4					0	28838.55	(0.03)	1496
	5	– 4					1	28751.81	(0.06)	1496
	5	– 4					2	28665.19	(0.06)	1496
$^{76}Ge^{78}Se$	2	– 1					0	11519.85	(0.06)	1496
	2	– 1					1	11485.23	(0.06)	1496
	4	– 3					0	23039.70	(0.06)	1496
$^{74}Ge^{82}Se$	2	– 1					0	11400.25	(0.06)	1496
	2	– 1					1	11366.19	(0.06)	1496
	4	– 3					0	22800.40	(0.06)	1496
	5	– 4					0	28500.40	(0.06)	1496
$^{76}Ge^{80}Se$	2	– 1					0	11377.74	(0.06)	1496

Isotopic Species	J' ← J''	F' F'1 ← F'' F''1	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{76}Ge^{80}Se$	2 – 1		1	11343.78	(0.06)	1496
	5 – 4		0	28444.08	(0.06)	1496

GeTe

Germanium Telluride

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{70}Ge^{124}Te$	44.6986697	2064.5701(18)	-5.5946(16)	-1.67(30)	-0.392(36)	b
$^{70}Ge^{125}Te$	44.8283521	2058.5975(18)	-5.5704(16)	-1.66(30)	-0.390(37)	b
$^{70}Ge^{126}Te$	44.9563624	2052.7358(18)	-5.5466(15)	-1.65(30)	-0.388(36)	b
$^{70}Ge^{128}Te$	45.2089274	2041.2680(18)	-5.5002(16)	-1.63(30)	-0.383(37)	b
$^{70}Ge^{130}Te$	45.4565085	2030.1501(18)	-5.4553(15)	-1.61(30)	-0.379(38)	b
$^{72}Ge^{124}Te$	45.5067205	2027.9100(18)	-5.4463(15)	-1.61(30)	-0.378(36)	b
$^{72}Ge^{129}Te$	45.6411410	2021.9375(18)	-5.4222(15)	-1.60(30)	-0.376(36)	b
$^{72}Ge^{126}Te$	45.7738422	2016.0758(17)	-5.3987(15)	-1.59(30)	-0.374(35)	b
$^{74}Ge^{122}Te$	46.0168661	2005.4285(17)	-5.3559(14)	-1.57(30)	-0.370(35)	b
$^{72}Ge^{128}Te$	46.0357027	2004.6080(17)	-5.3527(15)	-1.57(30)	-0.370(35)	b
$^{72}Ge^{130}Te$	46.2924478	1993.4901(15)	-5.3082(12)	-1.55(27)	-0.366(33)	b
$^{74}Ge^{124}Te$	46.2989467	1993.2103(15)	-5.3071(13)	-1.55(27)	-0.366(35)	b
$^{74}Ge^{125}Te$	46.4380954	1987.2377(15)	-5.2832(12)	-1.54(27)	-0.363(33)	b
$^{74}Ge^{126}Te$	46.5754783	1981.3760(15)	-5.2599(12)	-1.53(27)	-0.261(33)	b
$^{74}Ge^{128}Te$	46.8466182	1969.9082(15)	-5.2143(12)	-1.52(27)	-0.357(33)	b
$^{74}Ge^{130}Te$	47.1125142	1958.7903(15)	-5.1702(12)	-1.50(27)	-0.353(33)	1632[a]
$^{76}Ge^{126}Te$	47.3616732	1948.4855(15)	-5.1295(12)	-1.48(29)	-0.349(33)	b
$^{76}Ge^{128}Te$	47.6420716	1937.0177(15)	-5.0842(12)	-1.47(27)	-0.345(33)	b
$^{76}Ge^{130}Te$	47.9171006	1925.8998(15)	-5.0405(12)	-1.45(27)	-0.341(33)	b
$^{73}Ge^{130}Te$	46.7052540	1975.8705(15)	-5.2380(12)	-1.53(30)	-0.359(35)	b
$^{73}Ge^{128}Te$	46.4439224	1986.9884(15)	-5.2823(12)	-1.54(27)	-0.363(33)	b

Dipole Moment ($^{74}Ge^{130}Te$)			Hyperfine Structure ($^{73}Ge^{130}Te$)		
μ_0[D]	1.06(7)	[70014]	eq_0Q(Ge)[MHz]	153.1(30)	[71009]

[a]Determined in Ref. 1632 from a fit to the measurements on all isotopic species through the use of the isotopic relations.

[b]Calculated from the $^{74}Ge^{130}Te$ values via the isotopic relations.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{70}Ge^{124}Te$	3 – 2		0	12370.57	(0.06)	1632
$^{70}Ge^{125}Te$	3 – 2		0	12334.79	(0.06)	1632
$^{70}Ge^{126}Te$	3 – 2		0	12299.75	(0.03)	1632
	3 – 2		1	12266.41	(0.03)	1632
	3 – 2		2	12233.12	(0.06)	1632
	4 – 3		0	16399.59	(0.03)	1632
	4 – 3		1	16355.16	(0.03)	1632
$^{70}Ge^{128}Te$	3 – 2		0	12231.05	(0.03)	1632
	3 – 2		1	12198.01	(0.03)	1632
	3 – 2		2	12164.92	(0.09)	1632
	4 – 3		0	16308.03	(0.03)	1632
	4 – 3		1	16264.00	(0.03)	1632
$^{70}Ge^{130}Te$	3 – 2		0	12164.49	(0.03)	1632
	3 – 2		1	12131.78	(0.06)	1632
	3 – 2		2	12098.92	(0.06)	1632
	3 – 2		3	12066.15	(0.06)	1632
	4 – 3		0	16219.30	(0.03)	1632
	4 – 3		1	16175.66	(0.03)	1632
	4 – 3		2	16131.87	(0.06)	1632
$^{72}Ge^{124}Te$	3 – 2		0	12151.16	(0.09)	1632
	3 – 2		1	12118.28	(0.09)	1632
$^{72}Ge^{125}Te$	3 – 2		0	12115.33	(0.06)	1632
	3 – 2		1	12082.82	(0.09)	1632
$^{72}Ge^{126}Te$	3 – 2		0	12080.21	(0.03)	1632
	3 – 2		1	12047.83	(0.03)	1632
	3 – 2		2	12015.38	(0.06)	1632
	3 – 2		3	11982.98	(0.06)	1632
	4 – 3		0	16106.86	(0.03)	1632
	4 – 3		1	16063.73	(0.06)	1632
	5 – 4		0	20133.69	(0.06)	1632
$^{74}Ge^{122}Te$	3 – 2		0	12016.32	(0.09)	1632
$^{72}Ge^{128}Te$	3 – 2		0	12011.58	(0.03)	1632
	3 – 2		1	11979.42	(0.03)	1632
	3 – 2		2	11947.36	(0.03)	1632
	3 – 2		3	11915.13	(0.06)	1632
	4 – 3		0	16015.38	(0.03)	1632
	4 – 3		1	15972.51	(0.03)	1632
	5 – 4		0	20019.10	(0.03)	1632
	5 – 4		1	19965.62	(0.06)	1632
$^{72}Ge^{130}Te$	3 – 2		0	11945.00	(0.03)	1632
	3 – 2		1	11913.12	(0.03)	1632
	3 – 2		2	11881.20	(0.03)	1632
	3 – 2		3	11849.35	(0.06)	1632
	3 – 2		4	11817.58	(0.09)	1632
	4 – 3		0	15926.53	(0.03)	1632
	4 – 3		1	15884.10	(0.03)	1632
	5 – 4		1	19908.16	(0.03)	1632
	5 – 4		1	19855.09	(0.03)	1632
	5 – 4		2	19801.85	(0.06)	1632
$^{74}Ge^{124}Te$	3 – 2		0	11943.24	(0.06)	1632
	3 – 2		1	11911.41	(0.06)	1632
$^{74}Ge^{125}Te$	3 – 2		0	11907.54	(0.03)	1632
	3 – 2		1	11875.77	(0.06)	1632
	3 – 2		2	11844.13	(0.06)	1632
$^{74}Ge^{126}Te$	3 – 2		0	11872.41	(0.03)	1632
	3 – 2		1	11840.86	(0.03)	1632
	3 – 2		2	11809.30	(0.06)	1632
	3 – 2		3	11777.66	(0.06)	1632
	4 – 3		0	15829.75	(0.03)	1632
	4 – 3		1	15787.77	(0.03)	1632
	5 – 4		0	19787.24	(0.03)	1632
	5 – 4		1	19734.63	(0.03)	1632
	5 – 4		2	19681.99	(0.03)	1632
	5 – 4		3	19629.31	(0.06)	1632
$^{74}Ge^{128}Te$	3 – 2		0	11803.81	(0.03)	1632
	3 – 2		1	11772.46	(0.03)	1632
	3 – 2		2	11741.12	(0.03)	1632
	3 – 2		3	11709.76	(0.06)	1632
	3 – 2		4	11678.44	(0.06)	1632
	3 – 2		5	11647.11	(0.06)	1632
	4 – 3		0	15738.33	(0.03)	1632
	4 – 3		1	15696.57	(0.03)	1632
	4 – 3		2	15654.77	(0.03)	1632
	4 – 3		3	15612.99	(0.03)	1632
	5 – 4		0	19672.83	(0.03)	1632
	5 – 4		1	19620.65	(0.03)	1632
	5 – 4		2	19568.47	(0.03)	1632
	5 – 4		3	19516.23	(0.06)	1632
$^{74}Ge^{130}Te$	3 – 2		0	11737.20	(0.03)	1632
	3 – 2		1	11706.15	(0.03)	1632
	3 – 2		2	11675.16	(0.06)	1632
	3 – 2		3	11644.01	(0.06)	1632
	3 – 2		4	11612.92	(0.06)	1632
	3 – 2		5	11581.79	(0.06)	1632

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{74}Ge^{130}Te$	3 – 2		6	11550.69	(0.06)	1632
	4 – 3		0	15649.50	(0.03)	1632
	4 – 3		1	15608.20	(0.03)	1632
	4 – 3		2	15566.69	(0.06)	1632
	5 – 4		0	19561.94	(0.03)	1632
	5 – 4		1	19510.15	(0.03)	1632
	5 – 4		2	19458.40	(0.03)	1632
	5 – 4		3	19406.50	(0.06)	1632
$^{76}Ge^{126}Te$	3 – 2		0	11675.48	(0.06)	1632
$^{76}Ge^{128}Te$	3 – 2		0	11606.83	(0.03)	1632
	3 – 2		1	11576.35	(0.06)	1632
	3 – 2		2	11545.84	(0.06)	1632
$^{76}Ge^{130}Te$	3 – 2		0	11540.24	(0.03)	1632
	3 – 2		1	11510.01	(0.06)	1632
	3 – 2		2	11479.77	(0.06)	1632
$^{73}Ge^{130}Te$	3 – 2	13/2 – 11/2	0	11835.094	(0.10)	71013
	3 – 2	3/2 – 5/2	0	11835.942	(0.10)	71013
	3 – 2	9/2 – 11/2	0	11835.942	(0.10)	71013
	3 – 2	9/2 – 9/2	0	11835.942	(0.10)	71013
	3 – 2	15/2 – 13/2	0	11837.601	(0.10)	71013
$^{73}Ge^{128}Te$	3 – 2	13/2 – 11/2	0	11901.719	(0.10)	71013
	3 – 2	3/2 – 5/2	0	11902.639	(0.10)	71013
	3 – 2	9/2 – 11/2	0	11902.639	(0.10)	71013
	3 – 2	9/2 – 9/2	0	11902.639	(0.10)	71013
	3 – 2	15/2 – 13/2	0	11904.254	(0.10)	71013

HI

Hydrogen Iodide

	^{1}HI		^{2}HI		^{3}HI	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.	Value (Unc.)	Ref.
B_0 [MHz]	192657.577(19)	71002	97537.092(9)	71002	65752.31	a
D_0 [MHz]	6.203(3)	71002	1.578(1)	71002	0.715	a
eqQ(I) [MHz]	-1828.286(9)	68007	-1823.37(11)	71002	-1822.6(30)	230
c_H [kHz]	-49.22(22)	68007				
c_I [kHz]	351.1(3)	68007	165(6)	71002		
c_3 [kHz]	5.49(11)	68007				
c_4 [kHz]	-0.08(7)	68007				
μ_0 [D]	0.4477(5)	70003	0.445(20)	604		
μ_r [amu]	0.9998845		1.9826358		2.9460334	

[a]Calculated in Ref. 71002 from data in Ref. 230.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{1}H^{127}I$	1 – 0	3 , 5/2 – 2 , 5/2	0	384997.515	(0.01)	68007
	1 – 0	2 , 5/2 – 3 , 5/2	0	384997.546	(0.01)	68007
	1 – 0	4 , 7/2 – 3 , 5/2	0	385382.660	(0.01)	68007
	1 – 0	3 , 7/2 – 2 , 5/2	0	385382.710	(0.01)	68007
	1 – 0	1 , 3/2 – 2 , 5/2	0	385545.134	(0.01)	68007
	1 – 0	2 , 3/2 – 3 , 5/2	0	385545.180	(0.01)	68007
	2 – 1	5/2 – 3/2	0	770045.563	(0.10)	71002
	2 – 1	7/2 – 7/2	0	770117.606	(0.10)	71002
	2 – 1	3/2 – 3/2	0	770305.529	(0.20)	71002
	2 – 1	9/2 – 7/2	0	770471.867	(0.10)	71002
	2 – 1	7/2 – 5/2	0	770502.790	(0.10)	71002
	2 – 1	1/2 – 3/2	0	770540.543	(0.20)	71002
	2 – 1	5/2 – 5/2	0	770593.316	(0.10)	71002
$^{2}H^{127}I$	1 – 0	5/2 – 5/2	0	194776.100	(0.05)	520
	1 – 0	7/2 – 5/2	0	195159.554	(0.05)	520
	1 – 0	3/2 – 5/2	0	195322.706	(0.05)	520
	2 – 1	5/2 – 3/2	0	389712.610	(0.05)	71002
	2 – 1	7/2 – 7/2	0	389784.989	(0.05)	71002
	2 – 1	3/2 – 3/2	0	389972.523	(0.05)	71002
	2 – 1	9/2 – 7/2	0	390137.417	(0.05)	71002
	2 – 1	7/2 – 5/2	0	390168.462	(0.05)	71002
	2 – 1	1/2 – 3/2	0	390206.741	(0.05)	71002
	2 – 1	5/2 – 5/2	0	390259.212	(0.05)	71002
	2 – 1	3/2 – 5/2	0	390519.204	(0.05)	71002
	3 – 2	7/2 – 5/2	0	585000.078	(0.10)	71002
	3 – 2	11/2 – 9/2	0	585074.148	(0.10)	71002
$^{3}H^{127}I$	1 – 0	5/2 – 5/2	0	131210.20	(0.40)	230
	1 – 0	7/2 – 5/2	0	131592.95	(0.25)	230

HLi

Lithium Hydride

	$^{6}Li^{2}H$		$^{7}Li^{2}H$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	131615.07(250)	69011	126905.36(250)	69011
Y_{11} [MHz]	-2898.90(1000)	69011	-2744.61(1000)	69011
Y_{02} [MHz]	-8.47(10)	a	-8.17(10)	b
Y_{12} [kHz]	-0.22(10)	a	-0.20(10)	b
$eq_0Q(Li)$ [kHz]	7.5(10)	69045	349(1)	69045
$eq_1Q(Li)$ [kHz]	7.5(10)	69045		
$eq_eQ(Li)$ [kHz]	7.5(10)	69045		
$eq_0Q(D)$ [kHz]	33(1)	69045	33(1)	69045
$eq_1Q(D)$ [kHz]	33(1)	69045		
$eq_eQ(D)$ [kHz]	33(1)	69045		
c_{Li} [kHz]	3.2(10)	69045	5.50(25)	69045
c_H [kHz]	-1.3(5)	69045	0(1)	69045
c_3 [kHz]	0.660(25)	69045	1.371(25)	69045
c_4 [kHz]	0.0(3)	69045	0.0(3)	69045
μ_0 [D]	5.8694(10)	69045	5.8677(5)	69045
μ_1 [D]	5.9523(10)	69045		
g_J [μ_n]			-0.272(5)	63003
μ_r [amu]	1.5088720		1.5648708	

	^{6}LiH	^{7}LiH	
Constant	Value (Unc.)	Value (Unc.)	Ref.
$eq_0Q(Li)$ [kHz]	7.2(8)	346.75(25)	69045
$eq_1Q(Li)$ [kHz]	7.2(8)	332.0(5)	69045
c_{Li} [kHz]	3.9(5)	10.025(75)	69045
c_H [kHz]	-9.3(7)	-9.05(5)	69045
$c_3(v=0)$ [kHz]	4.311(25)	11.330(25)	69045
$c_3(v=1)$ [kHz]	4.147(25)	10.957(25)	69045
c_4 [kHz]	0.0(3)	0.0(3)	69045
μ_0 [D]	5.8836(12)	5.8820(4)	69045
μ_1 [D]	5.9929(16)	5.9905(5)	69045

[a]Calculated with isotopic relations from $^{7}Li^{2}H$.

[b]F. H. Crawford and T. Jorgensen, Phys. Rev. 47, 358 (1935).

Additional reference: 62000, 62002.

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{6}Li^{2}H$	1 – 0		0	260306.96	(0.05)	69011
	1 – 0		1	254596.63	(0.05)	69011
$^{7}Li^{2}H$	1 – 0		0	251043.53	(0.05)	69011
	1 – 0		1	245635.62	(0.05)	69011

HO

Hydroxyl Radical

$^{16}O^{1}H$		
Constant	Value (Unc.)	Ref.
α_p (MHz)	-2359.065(120)	68008
β_p (MHz)	581.415(60)	68008
$\lambda = A/B$	-7.5009(2)	68008
D_v (MHz)	107.60(60)	68008
δ (MHz)	-44.54(24)	68008
a (MHz)	86.0(6)	1014
b (MHz)	-119.0(4)	1014
c (MHz)	133.2(10)	1014
d (MHz)	56.5(4)	1014
B_0 (MHz)	555066	a
A_0 (MHz)	-4163508	a
μ (D)	1.660(10)	1368
μ_r (amu)	0.94808710	

^{16}OD		
Constant	Value (Unc.)	Ref.
α_p (MHz)	-1548.99(210)	175
β_p (MHz)	161.94(61)	175
$\lambda = A/B$	-13.954(60)	175
a (MHz)	+13.297(2)	73009
b (MHz)	-17.962(6)	73009
c (MHz)	+20.234(6)	73009
d (MHz)	+8.768(1)	73009
eqQ (MHz)	+0.143(2)	73009
$\overline{eq}Q$ (MHz)	-0.122(6)	73009
μ_r (amu)	1.78884797	

$^{17}O^{1}H$		
Constant	Value (Unc.)	Ref.
d (^{17}O) (MHz)	-415.3(20)	1737
$\nu(J = \frac{7}{2} \leftarrow \frac{7}{2})^{b}$ (MHz)	13334.09(30)	1737
μ_r (amu)	0.95141860	

[a] G.H. Dieke and H.M. Crosswhite, J. Quant. Spectrosc. Radiat. Transfer 2, 97 (1962).

[b] ν is the hypothetical Λ-doubling transition without any hyperfine energies in the $^{2}\Pi_{3/2}$ state.

Isotopic Species	J′ ← J″		F′ F′₁ ← F″ F″₁		v	Frequency (MHz)	(Unc.) (MHz)	Parity	Ref.
$^1H^{16}O$ $^2\Pi_{1/2}$	1/2	1/2	0	1	0	4660.242	(0.01)		68022
	1/2	1/2	1	1	0	4750.656	(0.01)		68022
	1/2	1/2	1	0	0	4765.562	(0.01)		68022
	3/2	3/2	1	2	0	7749.905	(0.01)		70044
	3/2	3/2	1	1	0	7761.747	(0.01)		70044
	3/2	3/2	2	2	0	7820.125	(0.01)		70044
	3/2	3/2	2	1	0	7831.962	(0.01)		70044
	5/2	5/2	2	3	0	8118.052	(0.01)		71015
	5/2	5/2	2	2	0	8135.868	(0.01)		71015
	5/2	5/2	3	3	0	8189.586	(0.01)		71015
	5/2	5/2	3	2	0	8207.401	(0.01)		71015
	11/2	11/2	6	6	0	8534.834	(0.03)		73016
	11/2	11/2	5	5	0	8580.137	(0.03)		73016
$^1H^{16}O$ $^2\Pi_{3/2}$	3/2	3/2	1	2	0	1612.231	(0.00)		72022
	3/2	3/2	1	1	0	1665.402	(0.00)		72022
	3/2	3/2	2	2	0	1667.359	(0.00)		72022
	3/2	3/2	2	1	0	1720.530	(0.00)		72022
	3/2	3/2	1	2	1	1489.437	(0.01)		73016
	3/2	3/2	1	1	1	1536.943	(0.01)		73016
	3/2	3/2	2	2	1	1538.704	(0.01)		73016
	3/2	3/2	2	1	1	1586.207	(0.01)		73016
	5/2	5/2	2	3	0	6016.746	(0.01)		68022
	5/2	5/2	2	2	0	6030.739	(0.01)		68022
	5/2	5/2	3	3	0	6035.085	(0.01)		68022
	5/2	5/2	3	2	0	6049.084	(0.01)		68022
	7/2	7/2	3	3	0	13434.63	(0.04)		68008
	7/2	7/2	4	4	0	13441.38	(0.04)		68008
	9/2	9/2	4	5	0	23805.13	(0.02)		68008
	9/2	9/2	4	4	0	23817.615	(0.00)		71016
	9/2	9/2	5	5	0	23826.621	(0.00)		71016
	9/2	9/2	5	4	0	23838.46	(0.02)		68008
	11/2	11/2	5	5	0	36983.47	(0.03)		68008
	11/2	11/2	6	6	0	36994.43	(0.05)		68008
$^2H^{16}O$ $^2\Pi_{1/2}$	1/2	1/2	1/2	3/2	0	3090.216	(0.00)		73009
	1/2	1/2	1/2	1/2	0	3093.606	(0.00)		73009
	1/2	1/2	3/2	3/2	0	3111.141	(0.00)		73009
	1/2	1/2	3/2	1/2	0	3114.529	(0.00)		73009
	5/2	5/2	3/2	3/2	0	8110.20	(0.01)		175
	5/2	5/2	5/2	5/2	0	8117.69	(0.01)		175
	5/2	5/2	7/2	7/2	0	8127.64	(0.02)		175
	7/2	7/2	5/2	5/2	0	9578.51	(0.15)		175
	7/2	7/2	7/2	7/2	0	9586.03	(0.10)		175
	7/2	7/2	9/2	9/2	0	9595.26	(0.10)		175
	9/2	9/2	7/2	7/2	0	10191.64	(0.10)		175
	9/2	9/2	9/2	9/2	0	10199.10	(0.10)		175
	9/2	9/2	11/2	11/2	0	10208.14	(0.10)		175
	11/2	11/2	9/2	9/2	0	9914.39	(0.10)		175
	11/2	11/2	11/2	11/2	0	9921.53	(0.10)		175
	11/2	11/2	13/2	13/2	0	9929.88	(0.10)		175
$^2H^{16}O$ $^2\Pi_{3/2}$	3/2	3/2	5/2	3/2	0	298.097	(0.00)		73009
	3/2	3/2	3/2	1/2	0	303.032	(0.00)		73009
	3/2	3/2	1/2	1/2	0	310.145	(0.00)		73009
	3/2	3/2	3/2	3/2	0	310.215	(0.00)		73009
	3/2	3/2	5/2	5/2	0	310.363	(0.00)		73009
	3/2	3/2	1/2	3/2	0	317.329	(0.00)		73009
	3/2	3/2	3/2	5/2	0	322.480	(0.00)		73009
	5/2	5/2	5/2	7/2	0	1185.871	(0.00)		73009
	5/2	5/2	3/2	5/2	0	1186.999	(0.00)		73009
	5/2	5/2	3/2	3/2	0	1190.566	(0.00)		73009
	5/2	5/2	5/2	5/2	0	1190.774	(0.00)		73009
	5/2	5/2	7/2	7/2	0	1191.105	(0.00)		73009
	5/2	5/2	5/2	3/2	0	1194.339	(0.00)		73009
	5/2	5/2	7/2	5/2	0	1196.006	(0.00)		73009
	7/2	7/2	7/2	5/2	0	2820.851	(0.00)		73009
	7/2	7/2	7/2	9/2	0	2821.086	(0.00)		73009
	7/2	7/2	5/2	5/2	0	2822.001	(0.00)		73009
	7/2	7/2	7/2	7/2	0	2822.388	(0.00)		73009
	7/2	7/2	7/2	9/2	0	2823.533	(0.00)		73009
	7/2	7/2	9/2	7/2	0	2824.228	(0.00)		73009
	11/2	11/2	9/2	9/2	0	8672.36	(0.10)		175
	11/2	11/2	11/2	11/2	0	8672.36	(0.10)		175
	11/2	11/2	13/2	13/2	0	8672.36	(0.10)		175
	13/2	13/2	11/2	11/2	0	12918.01	(0.10)		175
	13/2	13/2	13/2	13/2	0	12918.01	(0.10)		175
	13/2	13/2	15/2	15/2	0	12918.01	(0.10)		175
	15/2	15/2	13/2	13/2	0	18009.60	(0.10)		175
	15/2	15/2	15/2	15/2	0	18009.60	(0.10)		175
	15/2	15/2	17/2	17/2	0	18009.60	(0.10)		175
	17/2	17/2	15/2	15/2	0	23907.12	(0.10)		175
	17/2	17/2	17/2	17/2	0	23907.12	(0.10)		175
	17/2	17/2	19/2	19/2	0	23907.12	(0.10)		175
$^1H^{18}O$ $^2\Pi_{1/2}$	1/2	1/2	0	1	0	4644.650	(0.00)		73016
	1/2	1/2	1	1	0	4735.073	(0.00)		73016
	1/2	1/2	1	0	0	4749.971	(0.00)		73016

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Parity	Ref.
$^1H^{18}O$ $^2\Pi_{3/2}$	3/2 – 3/2	1 – 2	0	1584.274	(0.00)		73016
	3/2 – 3/2	1 – 1	0	1637.564	(0.00)		73016
	3/2 – 3/2	2 – 2	0	1639.503	(0.00)		73016
	3/2 – 3/2	2 – 1	0	1692.795	(0.00)		73016
	5/2 – 5/2	2 – 3	0	5920.505	(0.00)		73016
	5/2 – 5/2	2 – 2	0	5934.644	(0.00)		73016
	5/2 – 5/2	3 – 3	0	5938.967	(0.00)		73016
	5/2 – 5/2	3 – 2	0	5953.116	(0.00)		73016
	9/2 – 9/2	4 – 4	0	23469.5	(0.5)		175
	9/2 – 9/2	5 – 5	0	23479.1	(0.5)		175
$^1H^{17}O$ $^2\Pi_{3/2}$	7/2 – 7/2	9/2, 5 – 9/2, 5	0	13298.20	(0.20)		1737
	7/2 – 7/2	11/2, 5 – 11/2, 5	0	13304.08	(0.30)		1737
	7/2 – 7/2	7/2, 4 – 7/2, 4	0	13358.06	(0.30)		1737
	7/2 – 7/2	9/2, 4 – 9/2, 4	0	13363.06	(0.30)		1737

IIn

Indium Iodide

	$^{115}In^{127}I$	
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	1105.256(15)	70038
Y_{11} [MHz]	-3.121(6)	70038
Y_{21} [MHz]	+0.0024(6)	70038
Y_{02} [kHz]	-0.227(13)	70038
$eq_0Q(In)$ [MHz]	-607.07(50)	70038
$eq_1Q(In)$ [MHz]	-609.9(8)	70038
$eq_2Q(In)$ [MHz]	-605.8(15)	70038
$eq_3Q(In)$ [MHz]	-603.4(30)	70038
$eq_eQ(In)$ [MHz]	-607.5(7)	70038
$eq_0Q(I)$ [MHz]	-387.68(30)	70038
$eq_1Q(I)$ [MHz]	-389.9(5)	70038
$eq_2Q(I)$ [MHz]	-392.6(8)	70038
$eq_3Q(I)$ [MHz]	-397.0(30)	70038
$eq_eQ(I)$ [MHz]	-386.4(5)	70038
μ_r [amu]	60.3031945	

Isotopic Species	J' ← J''	F' X' ← F'' X''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{127}I$	3 – 2	9 , 1 – 9 , 1	0	6515.260	(0.05)	70038
	3 – 2	5 , 5 – 5 , 5	0	6564.820	(0.05)	70038
	3 – 2	5 , 4 – 4 , 4	0	6578.834	(0.05)	70038
	3 – 2	7 , 1 – 6 , 2	0	6583.692	(0.05)	70038
	3 – 2	7 , 3 – 7 , 3	0	6587.709	(0.05)	70038
	3 – 2	7 , 2 – 7 , 2	0	6598.676	(0.05)	70038
	3 – 2	5 , 2 – 5 , 2	0	6603.820	(0.05)	70038
	3 – 2	8 , 1 – 8 , 1	0	6605.139	(0.05)	70038
	3 – 2	6 , 4 – 5 , 3	0	6606.243	(0.05)	70038
	3 – 2	4 , 5 – 3 , 4	0	6609.552	(0.05)	70038
	3 – 2	5 , 2 – 4 , 2	0	6610.900	(0.05)	70038
	3 – 2	3 , 4 – 4 , 4	0	6616.531	(0.05)	70038
	3 – 2	7 , 4 – 6 , 4	0	6618.492	(0.05)	70038
	3 – 2	6 , 1 – 6 , 1	0	6618.492	(0.05)	70038
	3 – 2	6 , 1 – 5 , 1	0	6621.550	(0.05)	70038
	3 – 2	5 , 1 – 4 , 1	0	6622.278	(0.05)	70038
	3 – 2	8 , 3 – 7 , 3	0	6622.813	(0.05)	70038
	3 – 2	4 , 1 – 3 , 1	0	6622.813	(0.05)	70038
	3 – 2	3 , 2 – 3 , 2	0	6624.305	(0.05)	70038
	3 – 2	3 , 1 – 2 , 1	0	6624.305	(0.05)	70038
	3 – 2	6 , 5 – 5 , 4	0	6624.305	(0.05)	70038
	3 – 2	8 , 1 – 7 , 1	0	6624.305	(0.05)	70038
	3 – 2	6 , 4 – 6 , 3	0	6625.759	(0.05)	70038
	3 – 2	7 , 1 – 7 , 1	0	6628.349	(0.05)	70038
	3 – 2	9 , 2 – 8 , 2	0	6628.825	(0.05)	70038
	3 – 2	5 , 6 – 4 , 5	0	6630.385	(0.05)	70038
	3 – 2	7 , 2 – 6 , 1	0	6630.385	(0.05)	70038
	3 – 2	5 , 4 – 5 , 3	0	6630.385	(0.05)	70038
	3 – 2	10 , 1 – 9 , 1	0	6634.202	(0.05)	70038
	3 – 2	6 , 2 – 6 , 1	0	6634.202	(0.05)	70038
	3 – 2	4 , 6 – 5 , 5	0	6637.308	(0.05)	70038
	3 – 2	2 , 4 – 2 , 3	0	6637.308	(0.05)	70038
	3 – 2	8 , 2 – 7 , 2	0	6638.617	(0.05)	70038
	3 – 2	3 , 5 – 4 , 4	0	6640.542	(0.05)	70038
	3 – 2	5 , 2 – 5 , 1	0	6644.968	(0.05)	70038
	3 – 2	6 , 3 – 6 , 2	0	6646.068	(0.05)	70038
	3 – 2	2 , 3 – 3 , 3	0	6647.804	(0.05)	70038
	3 – 2	7 , 3 – 6 , 2	0	6652.393	(0.05)	70038
	3 – 2	9 , 1 – 8 , 1	0	6652.775	(0.05)	70038
	3 – 2	6 , 5 – 6 , 4	0	6653.714	(0.05)	70038
	3 – 2	5 , 3 – 5 , 2	0	6654.834	(0.05)	70038
	3 – 2	3 , 4 – 4 , 3	0	6659.760	(0.05)	70038
	3 – 2	4 , 3 – 4 , 2	0	6662.145	(0.05)	70038
	3 – 2	5 , 5 – 6 , 3	0	6670.936	(0.05)	70038
	3 – 2	9 , 1 – 9 , 1	1	6496.555	(0.05)	70038
	3 – 2	5 , 5 – 5 , 5	1	6546.089	(0.05)	70038
	3 – 2	7 , 1 – 6 , 2	1	6564.820	(0.05)	70038
	3 – 2	8 , 1 – 8 , 1	1	6586.805	(0.05)	70038
	3 – 2	6 , 4 – 5 , 3	1	6587.709	(0.05)	70038
	3 – 2	7 , 3 – 6 , 3	1	6588.300	(0.05)	70038
	3 – 2	3 , 4 – 4 , 4	1	6597.895	(0.05)	70038
	3 – 2	7 , 4 – 6 , 4	1	6599.710	(0.05)	70038
	3 – 2	6 , 1 – 5 , 1	1	6602.890	(0.05)	70038
	3 – 2	8 , 3 – 7 , 3	1	6604.075	(0.05)	70038
	3 – 2	4 , 1 – 3 , 1	1	6604.330	(0.05)	70038
	3 – 2	3 , 1 – 2 , 1	1	6605.463	(0.05)	70038
	3 – 2	6 , 5 – 5 , 4	1	6605.463	(0.05)	70038
	3 – 2	8 , 1 – 7 , 1	1	6605.680	(0.05)	70038
	3 – 2	6 , 4 – 6 , 3	1	6607.096	(0.05)	70038
	3 – 2	7 , 1 – 7 , 1	1	6609.552	(0.05)	70038
	3 – 2	9 , 2 – 8 , 2	1	6610.190	(0.05)	70038
	3 – 2	5 , 6 – 4 , 5	1	6611.653	(0.05)	70038
	3 – 2	7 , 2 – 6 , 1	1	6611.653	(0.05)	70038
	3 – 2	10 , 1 – 9 , 1	1	6615.526	(0.05)	70038
	3 – 2	4 , 6 – 5 , 5	1	6618.492	(0.05)	70038
	3 – 2	8 , 2 – 7 , 2	1	6619.972	(0.05)	70038
	3 – 2	9 , 1 – 8 , 1	1	6634.202	(0.05)	70038
	3 – 2	4 , 3 – 4 , 2	1	6643.414	(0.05)	70038
	3 – 2	5 , 5 – 6 , 3	1	6652.393	(0.05)	70038
	3 – 2	6 , 3 – 7 , 1	1	6672.268	(0.05)	70038
	3 – 2	7 , 2 – 7 , 2	2	6560.975	(0.05)	70038
	3 – 2	8 , 1 – 8 , 1	2	6568.059	(0.05)	70038
	3 – 2	7 , 3 – 6 , 3	2	6569.614	(0.05)	70038
	3 – 2	7 , 4 – 6 , 4	2	6580.720	(0.05)	70038
	3 – 2	5 , 1 – 4 , 1	2	6585.235	(0.05)	70038
	3 – 2	8 , 3 – 7 , 3	2	6585.235	(0.05)	70038
	3 – 2	4 , 1 – 3 , 1	2	6585.235	(0.05)	70038
	3 – 2	6 , 5 – 5 , 4	2	6586.805	(0.05)	70038
	3 – 2	8 , 1 – 7 , 1	2	6586.805	(0.05)	70038
	3 – 2	7 , 1 – 7 , 1	2	6590.898	(0.05)	70038
	3 – 2	9 , 2 – 8 , 2	2	6591.465	(0.05)	70038
	3 – 2	5 , 6 – 4 , 5	2	6593.079	(0.05)	70038
	3 – 2	7 , 2 – 6 , 1	2	6593.079	(0.05)	70038
	3 – 2	5 , 4 – 5 , 3	2	6593.079	(0.05)	70038

Isotopic Species	J' ← J''	F' X' ← F'' X''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{115}In^{127}I$	3 – 2	10 , 1 – 9 , 1	2	6596.921	(0.05)	70038
	3 – 2	4 , 6 – 5 , 6	2	6599.710	(0.05)	70038
	3 – 2	9 , 1 – 8 , 1	2	6615.526	(0.05)	70038
	3 – 2	5 , 1 – 4 , 1	3	6566.465	(0.05)	70038
	3 – 2	8 , 3 – 7 , 3	3	6566.465	(0.05)	70038
	3 – 2	6 , 5 – 5 , 4	3	6568.059	(0.05)	70038
	3 – 2	8 , 1 – 7 , 1	3	6568.059	(0.05)	70038
	3 – 2	5 , 6 – 4 , 5	3	6574.380	(0.05)	70038
	3 – 2	7 , 2 – 6 , 1	3	6574.380	(0.05)	70038
	3 – 2	10 , 1 – 9 , 1	3	6578.232	(0.05)	70038
	3 – 2	9 , 1 – 8 , 1	3	6596.921	(0.05)	70038
	3 – 2	10 , 1 – 9 , 1	4	6559.510	(0.05)	70038
	3 – 2	8 , 2 – 7 , 2	4	6563.315	(0.05)	70038
	3 – 2	9 , 1 – 8 , 1	4	6578.232	(0.05)	70038
	11 – 10		0	24275.39	(0.20)	509
	11 – 10		0	24278.01	(0.20)	509
	11 – 10		0	24279.23	(0.20)	509
	11 – 10		0	24280.42	(0.20)	509
	11 – 10		0	24282.48	(0.20)	509
	11 – 10		1	24260.89	(0.20)	509
	11 – 10		1	24209.36	(0.20)	509
	11 – 10		1	24210.68	(0.20)	509
	11 – 10		1	24211.78	(0.20)	509
	11 – 10		1	24213.78	(0.20)	509
	11 – 10		2	24140.91	(0.20)	509
	11 – 10		2	24143.30	(0.20)	509
	15 – 14		0	33108.26	(0.30)	70038
	15 – 14		1	33014.90	(0.30)	70038
	15 – 14		2	32921.63	(0.30)	70038
	16 – 15		0	35314.87	(0.30)	70038
	16 – 15		1	35215.33	(0.30)	70038
	16 – 15		2	35115.95	(0.30)	70038
	16 – 15		3	35016.63	(0.30)	70038
	16 – 15		4	34916.93	(0.30)	70038
	17 – 16		0	37521.78	(0.30)	70038
	17 – 16		1	37415.79	(0.30)	70038
	17 – 16		2	37309.93	(0.30)	70038
	18 – 17		0	39728.43	(0.30)	70038
	18 – 17		1	39616.15	(0.30)	70038
	18 – 17		2	39504.12	(0.30)	70038
	18 – 17		3	39392.36	(0.30)	70038

IK

Potassium Iodide

$^{39}K^{127}I$		
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	1824.9786(13)	1019
Y_{11} [MHz]	-8.0272(15)	1019
Y_{21} [MHz]	-0.01162(39)	1019
Y_{02} [kHz]	-0.77749(31)	1019
Y_{12} [Hz]	0.13(18)	1019
Y_{03} [10^{-6}Hz]	-80(X)[a]	1019
$eq_0Q(K)$ [MHz]	-4.12(10)	73006
$eq_1Q(K)$ [MHz]	-4.06(10)	73006
$eq_2Q(K)$ [MHz]	-3.98(20)	73006
$eq_3Q(K)$ [MHz]	-4.13(30)	73006
$eq_0Q(I)$ [MHz]	-86.79(10)	73006
$eq_1Q(I)$ [MHz]	-89.80(10)	73006
$eq_2Q(I)$ [MHz]	-92.62(15)	73006
$eq_3Q(I)$ [MHz]	-95.59(15)	73006
$eq_eQ(I)$ [MHz]	-85.32(10)	73006
μ_0 [D]	10.82(10)	68001
μ_r [amu]	29.8108349	

[a] Estimated in Ref. 1019.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{39}K^{127}I$	2 – 1	4 , 5/2 – 3 , 3/2	0	7265.324	(0.05)	73006
	2 – 1	3 , 5/2 – 2 , 3/2	0	7265.704	(0.05)	73006
	2 – 1	5 , 7/2 – 5 , 7/2	0	7268.717	(0.05)	73006
	2 – 1	4 , 7/2 – 4 , 7/2	0	7269.147	(0.05)	73006
	2 – 1	0 , 3/2 – 1 , 3/2	0	7277.112	(0.05)	73006
	2 – 1	3 , 3/2 – 3 , 3/2	0	7277.667	(0.05)	73006
	2 – 1	2 , 3/2 – 1 , 3/2	0	7278.335	(0.05)	73006
	2 – 1	6 , 9/2 – 5 , 7/2	0	7285.779	(0.05)	73006
	2 – 1	4 , 7/2 – 3 , 5/2	0	7286.522	(0.05)	73006
	2 – 1	3 , 7/2 – 2 , 5/2	0	7287.095	(0.05)	73006
	2 – 1	5 , 7/2 – 4 , 5/2	0	7287.450	(0.05)	73006
	2 – 1	2 , 5/2 – 1 , 7/2	0	7287.907	(0.05)	73006
	2 – 1	1 , 1/2 – 1 , 3/2	0	7289.027	(0.05)	73006
	2 – 1	3 , 5/2 – 3 , 5/2	0	7291.270	(0.05)	73006
	2 – 1	4 , 5/2 – 4 , 5/2	0	7291.720	(0.05)	73006
	2 – 1	3 , 3/2 – 4 , 5/2	0	7303.954	(0.05)	73006
	2 – 1	4 , 5/2 – 3 , 3/2	1	7232.660	(0.05)	73006
	2 – 1	5 , 7/2 – 5 , 7/2	1	7236.255	(0.05)	73006
	2 – 1	4 , 7/2 – 4 , 7/2	1	7236.676	(0.05)	73006
	2 – 1	3 , 3/2 – 3 , 3/2	1	7245.478	(0.05)	73006
	2 – 1	2 , 3/2 – 1 , 3/2	1	7246.080	(0.05)	73006
	2 – 1	6 , 9/2 – 5 , 7/2	1	7253.784	(0.05)	73006
	2 – 1	4 , 7/2 – 3 , 5/2	1	7254.626	(0.05)	73006
	2 – 1	3 , 7/2 – 2 , 5/2	1	7255.153	(0.05)	73006

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{39}K^{127}I$	2 – 1	5 , 7/2 – 4 , 5/2	1	7255.563	(0.05)	73006
	2 – 1	2 , 7/2 – 1 , 5/2	1	7255.988	(0.05)	73006
	2 – 1	2 , 1/2 – 3 , 3/2	1	7257.155	(0.05)	73006
	2 – 1	3 , 5/2 – 3 , 5/2	1	7259.519	(0.05)	73006
	2 – 1	4 , 5/2 – 4 , 5/2	1	7259.967	(0.05)	73006
	2 – 1	3 , 3/2 – 4 , 5/2	1	7272.660	(0.05)	73006
	2 – 1	5 , 7/2 – 5 , 7/2	2	7203.857	(0.05)	73006
	2 – 1	4 , 7/2 – 4 , 7/2	2	7204.204	(0.05)	73006
	2 – 1	3 , 3/2 – 3 , 3/2	2	7213.358	(0.05)	73006
	2 – 1	6 , 9/2 – 5 , 7/2	2	7221.915	(0.05)	73006
	2 – 1	4 , 7/2 – 3 , 5/2	2	7222.807	(0.05)	73006
	2 – 1	3 , 7/2 – 2 , 5/2	2	7223.334	(0.05)	73006
	2 – 1	5 , 7/2 – 4 , 5/2	2	7223.746	(0.05)	73006
	2 – 1	1 , 1/2 – 1 , 3/2	2	7225.436	(0.05)	73006
	2 – 1	3 , 5/2 – 3 , 5/2	2	7227.800	(0.05)	73006
	2 – 1	4 , 5/2 – 4 , 5/2	2	7228.280	(0.05)	73006
	2 – 1	3 , 3/2 – 4 , 5/2	2	7241.367	(0.05)	73006
	2 – 1	5 , 7/2 – 5 , 7/2	3	7171.482	(0.05)	73006
	2 – 1	4 , 7/2 – 4 , 7/2	3	7171.909	(0.05)	73006
	2 – 1	3 , 3/2 – 3 , 3/2	3	7181.327	(0.05)	73006
	2 – 1	6 , 9/2 – 5 , 7/2	3	7190.157	(0.05)	73006
	2 – 1	4 , 7/2 – 3 , 5/2	3	7191.069	(0.05)	73006
	2 – 1	3 , 7/2 – 2 , 5/2	3	7191.579	(0.05)	73006
	2 – 1	5 , 7/2 – 4 , 5/2	3	7192.013	(0.05)	73006
	2 – 1	1 , 1/2 – 1 , 3/2	3	7193.765	(0.05)	73006
	2 – 1	3 , 5/2 – 3 , 5/2	3	7196.189	(0.05)	73006
	2 – 1	4 , 5/2 – 4 , 5/2	3	7196.719	(0.05)	73006
	2 – 1	3 , 3/2 – 4 , 5/2	3	7210.218	(0.05)	73006
	5 – 4		0	18209.77	(0.10)	65
	5 – 4		1	18129.61	(0.20)	65
	6 – 5		0	21851.32	(0.10)	65
	6 – 5		1	21755.19	(0.10)	65
	6 – 5		2	21659.38	(0.10)	65
	6 – 5		3	21563.91	(0.10)	65
	6 – 5		5	21373.63	(0.10)	65
	6 – 5		6	21279.07	(0.10)	65
	6 – 5		7	21184.73	(0.10)	65
	7 – 6		0	25492.81	(0.15)	65
	7 – 6		1	25380.71	(0.15)	65
	7 – 6		2	25268.95	(0.15)	65
	7 – 6		3	25157.04	(0.30)	65
	27 – 26		0	98217.00	(0.10)	1019
	27 – 26		1	97838.77	(0.10)	1019
	27 – 26		2	97407.94	(0.10)	1019
	29 – 28		0	105540.31	(0.10)	1019
	29 – 28		1	105076.04	(0.10)	1019
	29 – 28		2	104613.14	(0.10)	1019
	30 – 29		0	109174.23	(0.10)	1019
	30 – 29		1	108693.88	(0.10)	1019
	30 – 29		2	108214.97	(0.10)	1019
	40 – 39		0	145478.34	(0.10)	1019
	40 – 39		1	144838.07	(0.10)	1019
	50 – 49		0	181707.95	(0.10)	1019
	50 – 49		1	180907.50	(0.10)	1019
	50 – 49		2	180109.35	(0.10)	1019
$^{41}K^{127}I$	6 – 5		0	21036.78	(0.10)	65

ILi

Lithium Iodide

	$^{6}Li^{127}I$		$^{7}Li^{127}I$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	15381.41(13)	a	13286.35(17)	c
Y_{11} [MHz]	-152.89(20)	a	-122.74(16)	d
Y_{21} [MHz]	+0.65(13)	b	+0.49(10)	d
Y_{02} [kHz]	-58.206(80)	b	-43.430(60)	e
$eq_0Q(I)$ [MHz]	-198.780(5)	1262	-198.28(50)	d
$eq_1Q(I)$ [MHz]	-207.453(10)	1262	-206.49(50)	d
$eq_2Q(I)$ [MHz]			-212.9(13)	d
$eq_eQ(I)$ [MHz]	-194.443(10)	1262	-194.42(80)	d
c_I [kHz]	7.7(4)	1262		
μ_0 [D]	7.4285(10)	1262		
μ_1 [D]	7.5120(10)	1262		
μ_e [D]	7.3867(15)	a		
μ_r [amu]	5.7429159		6.6484410	

[a]Calculated from data in Ref. 1262.

[b]Calculated with isotopic relations from isotope $^{7}Li^{127}I$.

[c]Average of data from Ref. 650 and 1019.

[d]Calculated with data from Ref. 650.

[e]Calculated with data from Ref. 1019.

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^6Li^{127}I$	1 – 0	5/2 – 5/2	0	30578.28	(0.10)	65
	1 – 0	7/2 – 5/2	0	30620.17	(0.10)	65
	1 – 0	5/2 – 3/2	0	30638.10	(0.15)	65
	1 – 0	7/2 – 5/2	1	30317.79	(0.20)	65
	1 – 0	5/2 – 3/2	1	30336.40	(0.40)	65
$^7Li^{127}I$	1 – 0	5/2 – 5/2	0	26418.44	(0.10)	65
	1 – 0	7/2 – 5/2	0	26460.14	(0.10)	65
	1 – 0	3/2 – 5/2	0	26477.88	(0.10)	65
	1 – 0	5/2 – 5/2	1	26173.72	(0.10)	65
	1 – 0	7/2 – 5/2	1	26217.11	(0.10)	65
	1 – 0	3/2 – 5/2	1	26235.65	(0.10)	65
	1 – 0	5/2 – 5/2	2	25931.21	(0.20)	65
	1 – 0	7/2 – 5/2	2	25975.62	(0.20)	65
	1 – 0	3/2 – 5/2	2	25995.48	(0.40)	65
	6 – 5	9/2 – 7/2	0	158660.44	(0.20)	1019
	6 – 5	11/2 – 9/2	0	158661.28	(0.20)	1019
	6 – 5	7/2 – 5/2	0	158662.00	(0.20)	1019
	6 – 5	13/2 – 11/2	0	158663.12	(0.20)	1019
	6 – 5	17/2 – 15/2	0	158664.12	(0.20)	1019
	6 – 5	15/2 – 13/2	0	158664.68	(0.20)	1019
	7 – 6	11/2 – 9/2	0	185089.47	(0.20)	1019
	7 – 6	13/2 – 11/2	0	185090.17	(0.20)	1019
	7 – 6	9/2 – 7/2	0	185090.17	(0.20)	1019
	7 – 6	15/2 – 13/2	0	185091.31	(0.20)	1019
	7 – 6	19/2 – 17/2	0	185091.98	(0.20)	1019
	7 – 6	17/2 – 15/2	0	185092.51	(0.20)	1019

INa

Sodium Iodide

	$^{23}Na^{127}I$	
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	3531.7232(43)	1019
Y_{11} [MHz]	-19.4198(52)	1019
Y_{21} [MHz]	0.0429(16)	1019
Y_{02} [kHz]	-2.9483(40)	1019
$eq_0Q(Na)$ [MHz]	-4.0730(10)	69012
$eq_1Q(Na)$ [MHz]	-4.0396(20)	69012
$eq_2Q(Na)$ [MHz]	-3.9978(40)	69012
$eq_3Q(Na)$ [MHz]	-3.9550(80)	69012
$eq_eQ(Na)$ [MHz]	-4.0866(30)	69012
$eq_0Q(I)$ [MHz]	-262.1407(10)	69012
$eq_1Q(I)$ [MHz]	-265.5233(20)	69012
$eq_2Q(I)$ [MHz]	-268.8414(40)	69012
$eq_3Q(I)$ [MHz]	-272.0900(80)	69012
$eq_eQ(I)$ [MHz]	-260.4250(30)	69012
c_{Na} [kHz]	0.74(8)	69012
c_I [kHz]	0.28(4)	69012
c_3 [kHz]	0.17(8)	69012
c_4 [kHz]	-0.27(8)	69012
μ_0 [D]	9.2357(30)	68000
μ_1 [D]	9.2865(30)	68000
μ_2 [D]	9.3368(30)	68000
μ_e [D]	9.2103(30)	68000
μ_r [amu]	19.4637541	

Additional references: 65

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{23}Na^{127}I$	3 − 2	3/2 − 1/2	0	21108.64	(0.20)	65
	3 − 2	5/2 − 3/2	0	21111.67	(0.20)	65
	3 − 2	7/2 − 5/2	0	21124.58	(0.20)	65
	3 − 2	11/2 − 9/2	0	21135.35	(0.20)	65
	3 − 2	9/2 − 7/2	0	21137.49	(0.20)	65
	3 − 2	3/2 − 3/2	0	21141.93	(0.20)	65
	3 − 2	5/2 − 5/2	0	21148.85	(0.20)	65
	3 − 2	9/2 − 9/2	1	20970.52	(0.20)	65
	3 − 2	7/2 − 5/2	1	21008.40	(0.20)	65
	3 − 2	9/2 − 7/2	1	21021.50	(0.20)	65
	3 − 2	9/2 − 9/2	2	20854.59	(0.20)	65
	3 − 2	5/2 − 3/2	2	20879.61	(0.20)	65
	3 − 2	7/2 − 5/2	2	20892.92	(0.20)	65
	3 − 2	9/2 − 7/2	2	20906.05	(0.20)	65
	3 − 2	11/2 − 9/2	2	20903.62	(0.20)	65
	3 − 2	5/2 − 5/2	2	20917.89	(0.20)	65
	3 − 2	9/2 − 9/2	3	20738.98	(0.20)	65
	3 − 2	5/2 − 3/2	3	20764.43	(0.40)	65
	3 − 2	7/2 − 5/2	3	20777.70	(0.20)	65
	3 − 2	11/2 − 9/2	3	20788.73	(0.20)	65
	3 − 2	9/2 − 7/2	3	20791.24	(0.20)	65
	3 − 2	5/2 − 5/2	3	20803.00	(0.20)	65
	3 − 2	7/2 − 5/2	4	20663.68	(0.20)	65
	3 − 2	11/2 − 9/2	4	20674.43	(0.20)	65
	3 − 2	9/2 − 7/2	4	20676.96	(0.20)	65
	14 − 13		0	98584.60	(0.20)	1019
	14 − 13		1	98043.38	(0.20)	1019
	14 − 13		2	97504.24	(0.20)	1019
	15 − 14		0	105621.23	(0.20)	1019
	15 − 14		1	105041.57	(0.20)	1019
	15 − 14		2	104463.92	(0.20)	1019
	16 − 15		0	112656.83	(0.20)	1019
	16 − 15		1	112038.42	(0.20)	1019
	20 − 19		0	140787.59	(0.10)	1019
	25 − 24		0	175918.87	(0.10)	1019
	25 − 24		1	174952.22	(0.10)	1019
	25 − 24		2	173989.84	(0.10)	1019
	27 − 26		0	189959.62	(0.10)	1019
	27 − 26		1	188915.02	(0.10)	1019
	27 − 26		2	187876.42	(0.10)	1019

IRb

Rubidium Iodide

	$^{85}Rb^{127}I$		$^{87}Rb^{127}I$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	984.3051(25)	a	970.7518(25)	c
Y_{11} [MHz]	-3.2786(20)	a	-3.2111(20)	c
Y_{21} [kHz]	2.95(30)	a	2.87(30)	c
Y_{02} [kHz]	-0.22121(10)	a	-0.21516(10)	c
Y_{12} [Hz]	-0.222(70)	a	-0.214(70)	c
Y_{03} [10^{-5}Hz]	-1.701(20)	b	-1.632(20)	c
μ_0 [D]	11.48(10)	68001		
μ_r [amu]	50.8728016		51.5830685	

[a] Refit of the data from Ref. 1019

[b] Calculated from potential constants used for preparing the fitting data.

[c] Calculated with isotopic relations from $^{85}Rb^{127}I$.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{85}Rb^{127}I$	11 – 10		0	21617.58	(0.10)	65
	12 – 11		1	23503.98	(0.10)	65
	12 – 11		2	23425.51	(0.10)	65
	13 – 12		0	25547.52	(0.10)	65
	13 – 12		1	25462.28	(0.10)	65
	13 – 12		2	25377.33	(0.10)	65
	13 – 12		3	25292.65	(0.10)	65
	13 – 12		4	25207.88	(0.20)	65
	13 – 12		5	25123.45	(0.10)	65
	13 – 12		6	25038.99	(0.10)	65
	80 – 79		0	156773.00	(0.10)	1019
	80 – 79		1	156248.91	(0.10)	1019
	80 – 79		2	155725.77	(0.10)	1019
	80 – 79		3	155203.66	(0.10)	1019
	99 – 98		0	193708.04	(0.10)	1019
	99 – 98		1	193059.15	(0.10)	1019
	100 – 99		0	195647.00	(0.10)	1019
	100 – 99		1	194991.56	(0.10)	1019
	100 – 99		2	194337.34	(0.10)	1019
$^{87}Rb^{127}I$	13 – 12		0	25196.01	(0.10)	65
	13 – 12		1	25112.84	(0.10)	65
	13 – 12		2	25029.38	(0.10)	65
	81 – 80		0	156543.86	(0.10)	1019
	81 – 80		1	156024.03	(0.10)	1019
	81 – 80		2	155505.26	(0.10)	1019
	101 –100		0	194879.52	(0.10)	1019

ITl

Thallium Iodide

	$^{205}Tl^{127}I$		$^{203}Tl^{127}I$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	814.4644(40)	a	817.5364(40)	d
Y_{11} [MHz]	-1.989(5)	530	-2.000(5)	d
Y_{02} [kHz]	-0.107(10)	b	-0.108(10)	d
$eq_0Q(I)$ [MHz]	-438.9163(5)	70015	-438.9173(10)	70015
$eq_1Q(I)$ [MHz]	-440.5098(10)	70015	-440.5099(20)	70015
$eq_2Q(I)$ [MHz]	-442.0950(30)	70015	-442.0990(40)	70015
$eq_3Q(I)$ [MHz]	-443.6740(40)	70015	-443.6810(60)	70015
$eq_eQ(I)$ [MHz]	-438.1165(20)	c	-438.1196(35)	c
c_{Tl} [kHz]	34.65(15)	70015	34.36(30)	70015
c_I [kHz]	3.05(5)	70015	3.09(10)	70015
c_3 [kHz]	-2.48(10)	70015	-2.59(20)	70015
c_4 [kHz]	-6.67(5)	70015	-6.57(10)	70015
μ_0 [D]	4.607(70)	71007		
μ_r [amu]	78.3785064		78.0839924	

[a]Calculated from data of Ref. 530 and 71007.

[b]Calculated from $Y_{02} \cong -4Y_{01}^3/\omega_e^2$ using $\omega_e = 150\ cm^{-1}$ from Ref. 50000.

[c]Calculated from Ref. 70015.

[d]Calculated with isotopic relations from $^{205}Tl^{127}I$.

Isotopic Species	J' ← J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{205}Tl^{127}I$	4 – 3	13/2 – 11/2	0	6511.137	(0.01)	71007
	4 – 3	11/2 – 9/2	0	6513.775	(0.02)	71007
	5 – 4	9/2 – 5/2	0	8131.45	(0.04)	530
	5 – 4	11/2 – 9/2	0	8133.10	(0.03)	530
	5 – 4	15/2 – 13/2	0	8136.96	(0.02)	530
	5 – 4	13/2 – 11/2	0	8138.66	(0.03)	530
	5 – 4	15/2 – 13/2	1	8117.06	(0.03)	530
	5 – 4	15/2 – 13/2	2	8097.22	(0.05)	530
	6 – 5	9/2 – 7/2	0	9755.55	(0.04)	530
	6 – 5	11/2 – 9/2	0	9757.30	(0.03)	530
	6 – 5	7/2 – 5/2	0	9758.18	(0.03)	530
	6 – 5	13/2 – 11/2	0	9761.27	(0.02)	530
	6 – 5	17/2 – 15/2	0	9763.27	(0.02)	530
	6 – 5	15/2 – 13/2	0	9764.52	(0.03)	530
	10 – 9	19/2 – 17/2	0	16268.26	(0.10)	509
	10 – 9	25/2 – 23/2	0	16270.38	(0.10)	509
	10 – 9	19/2 – 17/2	1	16228.26	(0.10)	509
	10 – 9	25/2 – 23/2	1	16230.50	(0.10)	509
	13 – 12	25/2 – 23/2	0	21148.78	(0.05)	509
	13 – 12	31/2 – 29/2	0	21149.81	(0.10)	509
	15 – 14	29/2 – 27/2	0	24402.36	(0.10)	509
	15 – 14	35/2 – 33/2	0	24403.14	(0.10)	509
	16 – 15		0	26029.54	(0.30)	509
	17 – 16		0	27655.37	(0.10)	509
	17 – 16		1	27588.22	(0.20)	509
	17 – 16		2	27520.39	(0.20)	509
$^{203}Tl^{127}I$	6 – 5	15/2 – 13/2	0	9801.20	(0.05)	530
	17 – 16		0	27760.25	(0.30)	509
	17 – 16		1	27692.01	(0.40)	509
	17 – 16		2	27624.02	(0.40)	509

NO

Nitric Oxide

	$^{14}N^{16}O$		$^{15}N^{16}O$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
B_{01} [MHz]	50121.15(20)	289	48375.04(20)	289
B_{02} [MHz]	51571.61(20)	628	49722.87(100)	e
D_{01} [kHz]	34(10)	289	17(10)	289
D_{02} [kHz]	319(30)	289	261(30)	289
α_p [MHz]	356.0940(8)	a	353.2840(10)	a
β_p [MHz]	1.4132(4)	a	1.3149(4)	a
a [^{14}N][MHz]	84.195(2)	72014	-118.189(3)	72014
b [^{14}N][MHz]	41.79(5)	72014	-59.18(5)	72014
c [^{14}N][MHz]	-58.66(5)	72014	83.51(5)	72014
d [^{14}N][MHz]	112.600(1)	72014	-157.929(1)	72014
$eq_{01}Q$[^{14}N][MHz]	-1.852(2)	72014		
$eq_{02}Q$[^{14}N][MHz]	24.23(8)	72014		
B_0 [MHz]	50847.62(30)	b	49050.13(35)	b
Y_{02} [MHz]	-0.177(50)	289	-139(50)	289
Y_{11} [MHz]	-534(10)	c	-506(10)	c
A [cm^{-1}]	123.160	d		b
μ_0 [D]	0.15872(2)	70045		
μ_r [amu]	7.4664332		7.7407738	

[a] Calculated from fine structure constants in [72014]. For further details concerning higher order terms in the fine and hyperfine structure see [72014]

[b] Calculated with data from [289] and [628]. The isotopic relations were used to calculate the $^{15}N^{16}O$ value from $^{14}N^{16}O$.

[c] R.H. Gillette and E.H. Eyster, Phys. Rev. 56, 1113 (1939).

[d] Th.C. James and R.J. Thibualt, J. Chem. Phys. 41, 2806 (1964).

[e] Calculated from B_{01} and B_0 of $^{15}N^{16}O$ and A_0 from $^{14}N^{16}O$.

Additional references: 41, 218, 518 and 66007.

Isotopic Species	J′	←	J″	F₊	←	F₋	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{14}N^{16}O$ $^2\Pi_{1/2}$	1/2	–	1/2	1/2	–	1/2	0	205.951	(0.00)	72014
	1/2	–	1/2	1/2	–	3/2	0	225.936	(0.00)	72014
	1/2	–	1/2	3/2	–	1/2	0	411.206	(0.00)	72014
	1/2	–	1/2	3/2	–	3/2	0	431.191	(0.00)	72014
	3/2	–	3/2	1/2	–	1/2	0	560.854	(0.00)	72014
	3/2	–	3/2	3/2	–	1/2	0	587.747	(0.00)	72014
	3/2	–	3/2	1/2	–	3/2	0	624.649	(0.00)	72014
	3/2	–	3/2	3/2	–	3/2	0	651.543	(0.00)	72014
	3/2	–	3/2	5/2	–	3/2	0	693.828	(0.00)	72014
	3/2	–	3/2	3/2	–	5/2	0	758.911	(0.00)	72014
	3/2	–	3/2	5/2	–	5/2	0	801.196	(0.00)	72014
	5/2	–	5/2	3/2	–	3/2	0	929.259	(0.00)	72014
	5/2	–	5/2	5/2	–	3/2	0	991.734	(0.00)	72014
	5/2	–	5/2	3/2	–	5/2	0	964.023	(0.00)	72014
	5/2	–	5/2	5/2	–	7/2	0	1072.596	(0.01)	72014
	5/2	–	5/2	7/2	–	5/2	0	1114.677	(0.02)	72014
	5/2	–	5/2	7/2	–	7/2	0	1160.777	(0.00)	72014
	7/2	–	7/2	7/2	–	5/2	0	1325.299	(0.00)	72014
	7/2	–	7/2	5/2	–	7/2	0	1348.459	(0.00)	72014
	7/2	–	7/2	9/2	–	7/2	0	1434.588	(0.00)	72014
	7/2	–	7/2	7/2	–	9/2	0	1467.511	(0.00)	72014
	7/2	–	7/2	9/2	–	9/2	0	1514.768	(0.00)	72014
	3/2	–	1/2	5/2	–	3/2	0	150176.54	(0.25)	53006
	3/2	–	1/2	3/2	–	1/2	0	150198.85	(0.25)	53006
	3/2	–	1/2	3/2	–	3/2	0	150218.89	(0.25)	53006
	3/2	–	1/2	1/2	–	1/2	0	150225.75	(0.25)	53006
	3/2	–	1/2	1/2	–	3/2	0	150245.69	(0.25)	53006
	3/2	–	1/2	3/2	–	1/2	0	150375.48	(0.25)	53006
	3/2	–	1/2	3/2	–	3/2	0	150439.22	(0.25)	53006
	3/2	–	1/2	3/2	–	5/2	0	150546.50	(0.25)	53006
	3/2	–	1/2	1/2	–	1/2	0	150580.70	(0.25)	53006
	3/2	–	1/2	1/2	–	3/2	0	150644.37	(0.25)	53006
	5/2	–	3/2	7/2	–	5/2	0	250435.60	(0.50)	289
	5/2	–	3/2	5/2	–	3/2	0	250439.20	(0.50)	289
	5/2	–	3/2	3/2	–	1/2	0	250447.16	(0.50)	289
	5/2	–	3/2	3/2	–	3/2	0	250474.02	(0.50)	289
	5/2	–	3/2	5/2	–	5/2	0	250481.52	(0.50)	289
	5/2	–	3/2	5/2	–	5/2	0	250707.12	(0.50)	289
	5/2	–	3/2	3/2	–	3/2	0	250752.61	(0.50)	289
	5/2	–	3/2	5/2	–	7/2	0	250794.99	(0.50)	289
	5/2	–	3/2	3/2	–	5/2	0	250814.64	(0.50)	289
	5/2	–	3/2	1/2	–	3/2	0	250816.24	(0.50)	289
$^{14}N^{16}O$ $^2\Pi_{3/2}$	3/2	–	3/2	3/2	–	3/2	0	0.612	(0.00)	72014
	3/2	–	3/2	5/2	–	5/2	0	1.029	(0.00)	72014
	3/2	–	3/2	1/2	–	3/2	0	46.464	(0.00)	72014
	3/2	–	3/2	5/2	–	3/2	0	73.286	(0.00)	72014
	3/2	–	3/2	3/2	–	5/2	0	74.931	(0.00)	72014
	5/2	–	5/2	5/2	–	5/2	0	3.121	(0.00)	72014
	5/2	–	5/2	7/2	–	7/2	0	3.923	(0.00)	72014
	5/2	–	5/2	5/2	–	3/2	0	34.390	(0.03)	72014
	5/2	–	5/2	5/2	–	7/2	0	40.172	(0.01)	72014
	5/2	–	5/2	7/2	–	5/2	0	47.211	(0.00)	72014
	7/2	–	7/2	5/2	–	7/2	0	31.550	(0.00)	72014
	7/2	–	7/2	7/2	–	9/2	0	39.221	(0.00)	72014
	9/2	–	9/2	9/2	–	7/2	0	35.045	(0.00)	72014
	9/2	–	9/2	11/2	–	9/2	0	40.512	(0.00)	72014
	11/2	–	11/2	13/2	–	11/2	0	13.905	(0.00)	72014
	11/2	–	11/2	11/2	–	11/2	0	30.265	(0.00)	72014
	11/2	–	11/2	9/2	–	9/2	0	31.124	(0.00)	72014
	11/2	–	11/2	13/2	–	13/2	0	32.425	(0.00)	72014
	11/2	–	11/2	11/2	–	13/2	0	48.786	(0.00)	72014
	13/2	–	13/2	13/2	–	15/2	0	36.196	(0.00)	72014
	13/2	–	13/2	11/2	–	13/2	0	38.243	(0.00)	72014
	13/2	–	13/2	13/2	–	13/2	0	48.578	(0.00)	72014
	13/2	–	13/2	11/2	–	11/2	0	49.405	(0.00)	72014
	13/2	–	13/2	15/2	–	15/2	0	51.260	(0.00)	72014
	13/2	–	13/2	13/2	–	11/2	0	59.742	(0.00)	72014
	13/2	–	13/2	15/2	–	13/2	0	63.640	(0.00)	72014
	15/2	–	15/2	17/2	–	15/2	0	63.552	(0.00)	72014
	15/2	–	15/2	15/2	–	13/2	0	64.778	(0.00)	72014
	15/2	–	15/2	15/2	–	15/2	0	72.786	(0.00)	72014
	15/2	–	15/2	13/2	–	13/2	0	73.540	(0.00)	72014
	15/2	–	15/2	17/2	–	17/2	0	76.025	(0.00)	72014
	15/2	–	15/2	13/2	–	15/2	0	81.547	(0.00)	72014
	15/2	–	15/2	15/2	–	17/2	0	85.255	(0.00)	72014
	17/2	–	17/2	17/2	–	19/2	0	96.951	(0.00)	72014
	17/2	–	17/2	15/2	–	17/2	0	97.483	(0.00)	72014
	17/2	–	17/2	17/2	–	17/2	0	103.575	(0.00)	72014
	17/2	–	17/2	15/2	–	15/2	0	104.216	(0.00)	72014
	17/2	–	17/2	19/2	–	19/2	0	107.400	(0.00)	72014
	17/2	–	17/2	17/2	–	15/2	0	110.306	(0.00)	72014
	17/2	–	17/2	19/2	–	17/2	0	114.024	(0.00)	72014
	5/2	–	3/2	5/2	–	7/2	0	257822.06	(0.30)	628
	5/2	–	3/2	7/2	–	5/2	0	257825.02	(0.30)	628

Isotopic Species	J' ← J''	F₊ ← F₋	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{14}N^{16}O$ $^2\Pi_{3/2}$	5/2 – 3/2	3/2 – 5/2	0	257852.87	(0.30)	628
	5/2 – 3/2	5/2 – 3/2	0	257855.36	(0.30)	628
	5/2 – 3/2	1/2 – 3/2	0	257867.67	(0.30)	628
	5/2 – 3/2	3/2 – 1/2	0	257870.35	(0.30)	628
$^{15}N^{16}O$ $^2\Pi_{1/2}$	1/2 – 1/2	1 – 1	0	290.657	(0.00)	72014
	1/2 – 1/2	1 – 0	0	309.226	(0.00)	72014
	1/2 – 1/2	0 – 1	0	482.621	(0.00)	72014
	3/2 – 3/2	2 – 2	0	622.569	(0.00)	72014
	3/2 – 3/2	1 – 2	0	670.708	(0.00)	72014
	3/2 – 3/2	2 – 1	0	742.836	(0.00)	72014
	3/2 – 3/2	1 – 1	0	790.975	(0.00)	72014
	5/2 – 5/2	3 – 3	0	958.918	(0.00)	72014
	5/2 – 5/2	3 – 2	0	1015.415	(0.00)	72014
	5/2 – 5/2	2 – 2	0	1121.151	(0.00)	72014
	7/2 – 7/2	3 – 3	0	1454.916	(0.00)	72014
	3/2 – 1/2	1 – 1	0	144927.81	(0.25)	289
	3/2 – 1/2	1 – 0	0	144946.34	(0.25)	289
	3/2 – 1/2	2 – 1	0	144976.00	(0.25)	289
	3/2 – 1/2	0 – 1	0	145236.09	(0.25)	289
	3/2 – 1/2	1 – 2	0	145307.81	(0.25)	289
	3/2 – 1/2	1 – 1	0	145428.07	(0.25)	289
	5/2 – 3/2	2 – 1	0	241715.40	(0.50)	289
	5/2 – 3/2	3 – 2	0	241723.79	(0.50)	289
	5/2 – 3/2	1 – 2	0	242046.03	(0.50)	289
	5/2 – 3/2	2 – 3	0	242060.35	(0.50)	289
$^{15}N^{16}O$ $^2\Pi_{3/2}$	3/2 – 3/2	2 – 2	0	0.780	(0.00)	72014
	3/2 – 3/2	2 – 1	0	84.589	(0.00)	72014
	5/2 – 5/2	3 – 3	0	3.154	(0.00)	72014
	5/2 – 5/2	2 – 2	0	3.393	(0.00)	72014
	5/2 – 5/2	2 – 3	0	55.738	(0.00)	72014
	11/2 – 11/2	5 – 6	0	6.070	(0.00)	72014
	11/2 – 11/2	6 – 6	0	27.657	(0.00)	72014
	11/2 – 11/2	5 – 5	0	28.664	(0.00)	72014
	11/2 – 11/2	6 – 5	0	50.251	(0.00)	72014
	13/2 – 13/2	7 – 6	0	27.335	(0.00)	72014
	13/2 – 13/2	7 – 7	0	44.092	(0.00)	72014
	13/2 – 13/2	6 – 6	0	45.461	(0.00)	72014
	13/2 – 13/2	6 – 7	0	62.218	(0.00)	72014
	15/2 – 15/2	7 – 8	0	52.912	(0.00)	72014
	15/2 – 15/2	8 – 8	0	65.811	(0.00)	72014
	15/2 – 15/2	7 – 7	0	67.591	(0.00)	72014
	15/2 – 15/2	8 – 7	0	80.489	(0.00)	72014
	17/2 – 17/2	9 – 8	0	83.761	(0.00)	72014
	17/2 – 17/2	9 – 9	0	93.441	(0.00)	72014
	17/2 – 17/2	8 – 8	0	95.679	(0.00)	72014
	17/2 – 17/2	8 – 9	0	105.359	(0.00)	72014

NP
Phosphorus Nitride

$^{31}P^{14}N$		
Constant	Value (Unc.)	Ref.
Y_{01} [MHz]	23578.240(11)	72015
Y_{11} [MHz]	-165.976(18)	72015
Y_{21} [MHz]	-0.192(9)	72015
Y_{31} [kHz]	-7.6(13)	72015
Y_{02} [kHz]	-32.70(8)	72015
$eq_0Q(N)$ [MHz]	-5.1416(5)	71009
$eq_1Q(N)$ [MHz]	-5.0805(5)	71009
$eq_2Q(N)$ [MHz]	-5.0203(5)	71009
$eq_eQ(N)$ [MHz]	-5.1718(5)[b]	71009
c_P [kHz]	-78.2(5)	71009
c_N [kHz]	10.4(5)	71009
μ_0 [D]	2.7470(8)[a]	71009
μ_1 [D]	2.7385(8)[a]	71009
μ_2 [D]	2.7299(8)[a]	71009
μ_e [D]	2.75128(80)[a]	71009
μ_r [amu]	9.64336178	

[a] Values as corrected with new rotational constants in Ref. 72010.

[b] Corrected error in Ref. 71009.

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{31}P^{14}N$	1 – 0	1 – 1	0	46989.017	(0.03)	72010
	1 – 0	2 – 1	0	46990.559	(0.02)	72010
	1 – 0	0 – 1	0	46992.862	(0.04)	72010
	1 – 0	1 – 1	1	46656.324	(0.10)	72010
	1 – 0	2 – 1	1	46657.845	(0.07)	72010
	2 – 1		0	93979.78	(0.10)	72015
	2 – 1		1	93314.23	(0.10)	72015
	3 – 2		0	140967.75	(0.10)	72015
	3 – 2		1	139969.38	(0.10)	72015
	3 – 2		2	138968.33	(0.10)	72015
	4 – 3		0	187953.26	(0.10)	72015
	4 – 3		1	186622.19	(0.10)	72015
	4 – 3		2	185287.43	(0.10)	72015
	4 – 3		3	183948.78	(0.10)	72015
	4 – 3		4	182605.78	(0.10)	72015
	5 – 4		0	234935.69	(0.10)	72015
	5 – 4		1	233279.82	(0.10)	72015
	5 – 4		2	231603.54	(0.10)	72015
	5 – 4		3	229930.13	(0.10)	72015
	6 – 5		0	281914.13	(0.10)	72015
	6 – 5		1	279917.59	(0.10)	72015
	7 – 6		0	328887.91	(0.10)	72015
	7 – 6		1	326558.57	(0.10)	72015
	8 – 7		0	375856.31	(0.10)	72015

NS

Nitrogen Sulfide

	$^{14}N^{32}S$	$^{14}N^{34}S$	
Constant	Value (Unc.)	Value (Unc.)	Ref.
B_{01} [MHz]	23072.10(13)	22661.58(11)	69013
B_{02} [MHz]	23238.61(18)		69013
Y_{02} [kHz]	-28(12)		69013
p_{eff} [MHz]	397.32(40)	389.61(59)	69013
a+(b+c)/2 [MHz]	56.35(83)		69013
a-(b+c)/2 [MHz]	67.45(50)	67.02(83)	69013
d [MHz]	87.03(42)	87.2(10)	69013
eq_0Q [^{14}N][MHz]	-2.62(73)	-1.7(15)	69013
B_0 [MHz]	23156.01(16)		69013
α_p [MHz]	-198.24(38)		69013
β_p [MHz]	-0.682(2)		69013
A [cm^{-1}]	222.94(17)		69013[a]
Y_{11} [MHz]	-184(10)		b
μ_0 [D]	1.81(2)		69013
μ_r [amu]	9.7380289	9.9154732	

[a]Calculated with data from reference given in footnote b.

[b]P.B. Zeeman, Can. J. Phys. 29, 174 (1951).

Additional references: 66010, 68030

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Parity	Ref.
$^{14}N^{32}S$ $^2\Pi_{1/2}$	3/2 – 1/2	5/2 – 3/2	0	69002.85	(0.10)	a	69013
	3/2 – 1/2	3/2 – 1/2	0	69016.92	(0.10)	a	69013
	3/2 – 1/2	3/2 – 3/2	0	69037.31	(0.10)	a	69013
	3/2 – 1/2	1/2 – 1/2	0	69040.17	(0.10)	a	69013
	3/2 – 1/2	1/2 – 3/2	0	69060.27	(0.10)	a	69013
	3/2 – 1/2	1/2 – 3/2	0	69283.13	(0.10)	b	69013
	3/2 – 1/2	3/2 – 3/2	0	69330.25	(0.10)	b	69013
	3/2 – 1/2	5/2 – 3/2	0	69411.35	(0.10)	b	69013
	3/2 – 1/2	1/2 – 1/2	0	69437.40	(0.10)	b	69013
	3/2 – 1/2	3/2 – 1/2	0	69484.97	(0.10)	b	69013
	5/2 – 3/2	7/2 – 5/2	0	115153.92	(0.10)	a	69013
	5/2 – 3/2	5/2 – 3/2	0	115156.97	(0.10)	a	69013
	5/2 – 3/2	3/2 – 1/2	0	115163.07	(0.10)	a	69013
	5/2 – 3/2	3/2 – 3/2	0	115185.55	(0.10)	a	69013
	5/2 – 3/2	5/2 – 5/2	0	115191.07	(0.10)	a	69013
	5/2 – 3/2	5/2 – 5/2	0	115489.61	(0.10)	b	69013
	5/2 – 3/2	3/2 – 3/2	0	115524.82	(0.10)	b	69013
	5/2 – 3/2	7/2 – 5/2	0	115556.43	(0.10)	b	69013
	5/2 – 3/2	5/2 – 3/2	0	115571.20	(0.10)	b	69013
	5/2 – 3/2	3/2 – 1/2	0	115571.20	(0.10)	b	69013
$^{14}N^{32}S$ $^2\Pi_{3/2}$	5/2 – 3/2	5/2 – 5/2	0	116147.76	(0.10)		69013
	5/2 – 3/2	5/2 – 3/2	0	116181.78	(0.10)		69013
	5/2 – 3/2	7/2 – 5/2	0	116181.78	(0.10)		69013
	5/2 – 3/2	5/2 – 3/2	0	116203.61	(0.10)		69013
	5/2 – 3/2	3/2 – 1/2	0	116214.47	(0.10)		69013
$^{14}N^{34}S$ $^2\Pi_{1/2}$	3/2 – 1/2	5/2 – 3/2	0	67775.33	(0.10)	a	69013
	3/2 – 1/2	3/2 – 1/2	0	67790.37	(0.10)	a	69013
	3/2 – 1/2	1/2 – 1/2	0	67812.31	(0.10)	a	69013
	3/2 – 1/2	3/2 – 3/2	0	67812.31	(0.10)	a	69013
	3/2 – 1/2	3/2 – 3/2	0	68095.64	(0.10)	b	69013
	3/2 – 1/2	5/2 – 3/2	0	68176.35	(0.10)	b	69013
	3/2 – 1/2	1/2 – 1/2	0	68202.37	(0.10)	b	69013
	3/2 – 1/2	3/2 – 1/2	0	68249.88	(0.10)	b	69013

O_2

Oxygen

Constant	$^{16}O_2$ Value (Unc.)	Ref.	$^{16}O^{17}O$ Value (Unc.)	Ref.	$^{16}O^{18}O$ Value (Unc.)	Ref.	$^{18}O_2$ Value (Unc.)	Ref.
B_0 [MHz]	43100.519(30)	d	41831.03(15)	a	40707.47(15)	a	38313.14(20)	a
λ_0 [MHz]	59501.337(20)	67005	59501.3(15)	a	59501.3(15)	a	59501.3(20)	a
γ_0 [MHz]	-252.586(10)	67005	-245.13(50)	a	-238.52(50)	a	-224.50(50)	a
D_0 [MHz]	0.1451(5)	b	0.13663(5)	a	0.1294(5)	a	0.1146(5)	a
ρ_0 [MHz]	0.05847(5)	67005						
$\gamma_{(1)}$ [Hz]	-246(4)	67005						
eqQ [MHz]			2.7	53004				
b [MHz]			-102	53002				
c [MHz]			140	53002				
Y_{01} [MHz]	43337.9(40)	c	42057.9(60)	a	40925.3(60)	a	38512.0(60)	a
Y_{11} [MHz]	-474.8(75)	73017	-453.9(75)	a	-435.7(75)	a	-397.7(75)	a
μ_r [amu]	7.99745751		8.2408709		8.4689768		8.99957998	

[a]Calculated with isotopic relations from $^{16}O_2$ values.
[b]Calculated with ω_e = 1580.19 cm^{-1} from reference 73017.
[c]Calculated with B_0 and Y_{11} given above.
[d]Corrected value from reference 68011.
Additional references: 68025, 72023, 72024.

Isotopic Species	J′, N′ ← J″, N″	F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{16}O^{16}O$	1, 1 – 0, 1		0	118750.343	(0.01)	68011
	3, 3 – 2, 3		0	62486.255	(0.01)	68011
	5, 5 – 4, 5		0	60306.044	(0.01)	915
	7, 7 – 6, 7		0	59164.215	(0.01)	915
	9, 9 – 8, 9		0	58323.885	(0.01)	915
	11, 11 – 10, 11		0	57612.3	(0.40)	51001
	13, 13 – 12, 13		0	56968.180	(0.01)	66006
	15, 15 – 14, 15		0	56363.393	(0.01)	66006
	17, 17 – 16, 17		0	55783.819	(0.01)	66006
	19, 19 – 18, 19		0	55221.372	(0.01)	66006
	21, 21 – 20, 21		0	54671.145	(0.01)	66006
	23, 23 – 22, 23		0	54129.4	(0.40)	100
	25, 25 – 24, 25		0	53599.4	(0.80)	100
	1, 1 – 2, 1		0	56264.766	(0.01)	66006
	3, 3 – 4, 3		0	58446.580	(0.01)	915
	5, 5 – 6, 5		0	59590.978	(0.01)	915
	7, 7 – 8, 7		0	60434.776	(0.01)	915
	9, 9 – 10, 9		0	61150.570	(0.01)	915
	11, 11 – 12, 11		0	61800.155	(0.01)	915
	13, 13 – 14, 13		0	62411.223	(0.01)	66006
	15, 15 – 16, 15		0	62996.6	(0.20)	100
	17, 17 – 18, 17		0	63568.520	(0.01)	915
	19, 19 – 20, 19		0	64127.777	(0.01)	66006
	21, 21 – 22, 21		0	64678.2	(0.20)	100
	23, 23 – 24, 23		0	65224.120	(0.20)	915
	25, 25 – 26, 25		0	65764.744	(0.01)	66006
	2, 3 – 1, 1		0	368499.02	(0.21)	68011
	2, 3 – 2, 1		0	424763.12	(0.10)	73019
	3, 3 – 2, 1		0	487250.05	(0.21)	68011

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{16}O^{17}O$	4 , 4 − 5 , 4	11/2 − 13/2	0	59250.	(X)	53002
	4 , 4 − 5 , 4	13/2 − 15/2	0	59398.	(X)	53002
	5 , 5 − 4 , 5	15/2 − 13/2	0	59989.	(X)	53002
	5 , 5 − 4 , 5	13/2 − 11/2	0	60130.	(X)	53002
	5 , 5 − 6 , 5	5/2 − 7/2	0	59359.	(X)	53002
	5 , 5 − 6 , 5	7/2 − 9/2	0	59431.	(X)	53002
	5 , 5 − 6 , 5	9/2 − 11/2	0	59519.	(X)	53002
	5 , 5 − 6 , 5	11/2 − 13/2	0	59627.	(X)	53002
	5 , 5 − 6 , 5	13/2 − 15/2	0	59748.	(X)	53002
	5 , 5 − 6 , 5	15/2 − 17/2	0	59889.	(X)	53002
	6 , 6 − 5 , 6	17/2 − 15/2	0	59385.	(X)	53002
	6 , 6 − 5 , 6	15/2 − 13/2	0	59519.	(X)	53002
	6 , 6 − 5 , 6	13/2 − 11/2	0	59638.	(X)	53002
	6 , 6 − 5 , 6	11/2 − 9/2	0	59737.	(X)	53002
	6 , 6 − 7 , 6	7/2 − 9/2	0	59790.	(X)	53002
	6 , 6 − 7 , 6	9/2 − 11/2	0	59864.	(X)	53002
	6 , 6 − 7 , 6	11/2 − 13/2	0	59956.	(X)	53002
	6 , 6 − 7 , 6	13/2 − 15/2	0	60060.	(X)	53002
	7 , 7 − 6 , 7	11/2 − 9/2	0	59322.	(X)	53002
	7 , 7 − 6 , 7	9/2 − 7/2	0	59390.	(X)	53002
$^{16}O^{18}O$	3 , 3 − 4 , 3		0	58650.	(2.)	51000
	4 , 4 − 5 , 4		0	59220.	(2.)	51000
	5 , 5 − 6 , 5		0	59685.	(2.)	51000
	6 , 6 − 5 , 6		0	59540.	(2.)	51000
	7 , 7 − 6 , 7		0	59075.	(2.)	51000
	8 , 8 − 7 , 8		0	58670.	(2.)	51000
	9 , 9 − 8 , 9		0	58310.	(2.)	51000
$^{18}O^{18}O$	3 , 3 − 4 , 3		0	58900.	(2.)	51000
	5 , 5 − 4 , 5		0	59875.	(2.)	51000
	5 , 5 − 6 , 5		0	59810.	(2.)	51000
	7 , 7 − 6 , 7		0	58965.	(2.)	51000
	2 , 3 − 2 , 1		0	378831.51	(0.20)	73019

OPb

Lead Monoxide

	$^{208}Pb^{16}O$	$^{207}Pb^{16}O$	$^{206}Pb^{16}O$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
B_0 [MHz]	9184.088(10)	9187.253(10)	9190.453(10)	1241
Y_{01} [MHz]	9212.791(12)	9215.971(12)	9219.183(12)	1241
Y_{11} [MHz]	-57.405(14)	-57.435(14)	-57.460(14)	1241
Y_{02} [kHz]	-6.68[a]	-6.68[a]	-6.68[a]	1241
μ_0 [D]	4.64(30)			69014
g_J [μ_n]	-0.16233(39)			73021
μ_r [amu]	14.8526392	14.8475124	14.8423358	

[a] Calculated from $Y_{02} = -4Y_{01}{}^3/\omega_e{}^2$, where ω_e = 721.26 cm^{-1} from R. F. Barrow, J. R. Deutsch and D. N. Travis, Nature (London) 191, 374 (1961).

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{208}Pb^{16}O$	1 − 0		0	18368.141	(0.02)	73021
	2 − 1		0	36736.14	(0.04)	1241
	2 − 1		1	36506.52	(0.04)	1241
$^{207}Pb^{16}O$	2 − 1		0	36748.80	(0.04)	1241
	2 − 1		1	36519.06	(0.04)	1241
$^{206}Pb^{16}O$	2 − 1		0	36761.60	(0.04)	1241
	2 − 1		1	36531.76	(0.04)	1241

OS

Sulfur Monoxide

$^{32}S^{16}O$			
Constant	v=0	v=1	Ref.
B_v [MHz]	21523.561(10)	21351.61(20)	73018
λ_v [MHz]	158258.7(24)	159212(30)	73018
γ_v [MHz]	-168.79(30)	-171.3(20)	73018
D_v [MHz][a]	0.03421(9)	b	68027
ρ_0 [MHz]	0.297(10)	b	73018
Y_{01} [MHz]	21609.55(10)		1578,73018
Y_{11} [MHz]	-171.96(20)		1578,73018
λ_e [MHz]	157784(15)		1578,73018
α^λ [MHz]	-952(23)		1578,73018
$\lambda_{(1)}$ [MHz]	$2.0(4)\times10^5$ [c]		
$\lvert\lambda_{(2)}\rvert$ [MHz]	$\leq 2\times10^5$ [c]		
μ_0 [D]	1.55(2)		1227
μ_r [amu]	10.6613029		

	$^{33}S^{16}O$	$^{34}S^{16}O$	$^{32}S^{18}O$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
B_0 [MHz]	21306.46(10)[d]	21102.722(26)	19929.192(66)	73018
λ_0 [MHz]	158257.3(50)[d]	158260(10)	158242(30)	73018
γ_0 [MHz]	-167.2(15)[d]	-166.2(11)	-156.4(40)	73018
ρ_0 [MHz]	0.300(30)[d]	0.288(30)	0.244(70)	73018
eqQ(S) [MHz]	-15.9(30)			1578
b [MHz]	-51.0(20)			1578
c [MHz]	-96.5(20)			1578
D_0 [kHz]	33.5(1)	32.9(1)	29.3(1)	d
μ_r [amu]	10.7701601	10.8743577	11.5160347	

[a] D_0 was calculated from ω_e and used as a constant in fitting the observed spectrum.

[b] For fitting the v=1 transitions, $D_0 \approx D_1$ and $\rho_0 \approx \rho_1$ was assumed.

[c] Calculated from α^λ and ρ_0 using formulas given in Ref. 68027.

[d] Calculated by isotope relations from $^{32}S^{16}O$ values.

Additional references: 1598,68027.

Isotopic Species	J', N' ← J'', N''	F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{32}S^{16}O$ $^3\Sigma$	1 , 0 – 0 , 1		0	30001.58	(0.10)	1578
	1 , 0 – 0 , 1		1	29949.36	(0.50)	1578
	2 , 1 – 1 , 0		0	62931.80	(0.20)	1578
	2 , 1 – 1 , 0		1	62692.65	(0.50)	1578
	1 , 2 – 1 , 1		0	13043.70	(0.10)	1578
	1 , 2 – 1 , 1		1	12752.90	(0.50)	1578
	2 , 2 – 1 , 1		0	86093.95	(0.10)	73018
	3 , 2 – 2 , 1		0	99299.87	(0.10)	73018
	2 , 3 – 2 , 2		0	36201.82	(0.15)	73018
	2 , 3 – 2 , 2		1	35461.40	(0.50)	1578
	2 , 3 – 1 , 2		0	109252.10	(0.10)	73018
	3 , 3 – 2 , 2		0	129138.85	(0.10)	73018
	4 , 3 – 3 , 2		0	138178.60	(0.50)	1250
	3 , 4 – 3 , 3		0	66034.94	(0.20)	1578
	3 , 4 – 3 , 3		1	64804.47	(0.50)	1578
	3 , 4 – 2 , 3		0	158971.80	(0.50)	1250
	4 , 4 – 3 , 3		0	172181.46	(0.50)	1250
	4 , 5 – 4 , 4		0	100019.64	(0.15)	73018
$^{33}S^{16}O$ $^3\Sigma$	1 , 0 – 0 , 1	1/2 – 3/2	0	29805.98	(0.50)	1578
	1 , 0 – 0 , 1	3/2 – 3/2	0	29819.63	(0.50)	1578
	1 , 0 – 0 , 1	5/2 – 3/2	0	29857.30	(0.50)	1578
	2 , 1 – 1 , 0	3/2 – 5/2	0	62433.68	(0.50)	1578
	2 , 1 – 1 , 0	1/2 – 3/2	0	62456.82	(0.50)	1578
	2 , 1 – 1 , 0	5/2 – 5/2	0	62461.10	(0.50)	1578
	2 , 1 – 1 , 0	3/2 – 3/2	0	62471.40	(0.50)	1578
	2 , 1 – 1 , 0	3/2 – 1/2	0	62484.90	(0.50)	1578
	2 , 1 – 1 , 0	5/2 – 3/2	0	62498.72	(0.50)	1578
	2 , 1 – 1 , 0	7/2 – 5/2	0	62506.20	(0.50)	1578
	1 , 2 – 1 , 1	5/2 – 3/2	0	12695.08	(0.50)	1578
	1 , 2 – 1 , 1	5/2 – 5/2	0	12752.90	(0.50)	1578
	1 , 2 – 1 , 1	1/2 – 3/2	0	12839.40	(0.50)	1578
	1 , 2 – 1 , 1	3/2 – 5/2	0	12846.96	(0.50)	1578
	2 , 3 – 2 , 2	7/2 – 7/2	0	35469.40	(0.50)	1578
	2 , 3 – 2 , 2	5/2 – 5/2	0	35511.80	(0.50)	1578
	2 , 3 – 2 , 2	3/2 – 3/2	0	35541.20	(0.50)	1578
	2 , 3 – 2 , 2	3/2 – 5/2	0	35561.15	(0.50)	1578
	3 , 4 – 3 , 3	9/2 – 9/2	0	64807.12	(0.50)	1578
	3 , 4 – 3 , 3	7/2 – 7/2	0	64853.15	(0.50)	1578
	3 , 4 – 3 , 3	5/2 – 5/2	0	64888.67	(0.50)	1578
	3 , 4 – 3 , 3	3/2 – 3/2	0	64914.21	(0.50)	1578
$^{34}S^{16}O$ $^3\Sigma$	1 , 0 – 0 , 1		0	29678.98	(0.10)	73018
	2 , 1 – 1 , 0		0	62074.30	(0.20)	1578
	1 , 2 – 1 , 1		0	12524.30	(0.20)	1578
	2 , 2 – 1 , 1		0	84410.69	(0.10)	73018
	3 , 2 – 2 , 1		0	97715.39	(0.15)	73018
	2 , 3 – 2 , 2		0	34857.16	(0.20)	1578
	2 , 3 – 1 , 2		0	106742.92	(0.15)	73018
	3 , 3 – 2 , 2		0	126613.93	(0.10)	73018
	3 , 4 – 3 , 3		0	63750.17	(0.20)	1578
	4 , 5 – 4 , 4		0	96781.76	(0.20)	73018
$^{32}S^{18}O$ $^3\Sigma$	2 , 1 – 1 , 0		0	59626.45	(0.15)	73018
	2 , 2 – 1 , 1		0	79716.27	(0.20)	73018
	3 , 2 – 2 , 1		0	93267.27	(0.20)	73018
	2 , 3 – 1 , 2		0	99803.32	(0.30)	73018
	3 , 3 – 2 , 2		0	119572.73	(0.40)	73018
$^{32}S^{16}O$ $^1\Delta$	3 , – 2 ,		0	127770.47	(0.15)	70017

Sulfur Monoxide $^1\Delta$

$^{32}S^{16}O$		
Constant	Value (Unc.)	Ref.
B_0 [MHz]	21295.1(7)	70017
μ_0 [D]	1.336(45)	70017

Additional Reference: 1597

OSi

Silicon Monoxide

	$^{28}Si^{16}O$	$^{29}Si^{16}O$	$^{30}Si^{16}O$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.
Y_{01} [MHz]	21787.462(25)	21514.074(25)	21259.485(25)	68026
Y_{11} [MHz]	-151.05(4)	-148.22(4)	-145.59(4)	68026
Y_{21} [MHz]	0.076(1)	0.074(1)	0.072(1)	68026
Y_{02} [kHz]	-29.9(1)[a]	-29.2(1)[b]	-28.5(1)[b]	68026
$\|g_J\|(v=0)$ [μ_n]	0.15359(6)			73015
$\|g_J\|(v=1)$ [μ_n]	0.15450(6)			73015
$\|g_J\|(v=2)$ [μ_n]	0.15539(6)			73015
μ_0 [D]	3.0982(10)			70013
μ_1 [D]	3.1178(10)			70013
μ_2 [D]	3.1372(10)			70013
μ_3 [D]	3.1574(10)			70013
μ_e [D]	3.0882(10)			70013
μ_r [amu]	10.1767076	10.3060274	10.4294460	

[a]Calculated from $Y_{02} \cong -D_e = -4B_e^3/\omega_e^2$ where $\omega_e = 1241(1)$ cm^{-1} from A. Lagerqvist, Ark. Fys. 6, 95 (1952).

[b]Calculated from value for $^{28}Si^{16}O$ by isotope relations.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{28}Si^{16}O$	1 – 0		0	43423.76	(0.10)	68026
	1 – 0		1	43122.03	(0.10)	68026
	1 – 0		2	42820.48	(0.10)	68026
	1 – 0		3	42519.34	(0.10)	68026
$^{29}Si^{16}O$	1 – 0		0	42879.82	(0.10)	68026
$^{30}Si^{16}O$	1 – 0		0	42373.34	(0.10)	68026

OSn

Tin Monoxide

Isotopic species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{124}Sn^{16}O$	14.1662021	10623.638(17)	-63.877(37)	-22(14)	-7.92(2)	1708
$^{122}Sn^{16}O$	14.1396551	10643.583(17)	-64.057(37)	-22(14)	-7.95(2)	1708
$^{120}Sn^{16}O$	14.1123343	10664.189(17)	-64.243(37)	-22(14)	-7.98(2)	1708
$^{119}Sn^{16}O$	14.0993942	10674.733(17)	-64.338(37)	-22(14)	-8.00(2)	1708
$^{118}Sn^{16}O$	14.0842060	10685.487(17)	-64.435(37)	-22(14)	-8.01(2)	1708
$^{117}Sn^{16}O$	14.0698481	10696.391(17)	-64.534(37)	-22(14)	-8.03(2)	1708
$^{116}Sn^{16}O$	14.0552351	10707.512(17)	-64.634(37)	-22(14)	-8.04(2)	1708

Dipole Moment ($^{120}Sn^{16}O$)

μ_0[D] 4.32(10) [69014]

g_J[μ_n] -0.14631(38) [73021]

Isotopic Species	J'	←	J''	F' F_1' ← F'' F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{124}Sn^{16}O$	2	–	1		0	42366.54	(0.10)	1708
$^{122}Sn^{16}O$	2	–	1		0	42445.90	(0.10)	1708
$^{120}Sn^{16}O$	1	–	0		0	21264.130	(0.01)	73021
	2	–	1		0	42527.97	(0.05)	1708
	2	–	1		1	42270.90	(0.10)	1708
	2	–	1		2	42013.57	(0.15)	1708
$^{119}Sn^{16}O$	2	–	1		0	42569.90	(0.10)	1708
$^{119}Sn^{16}O$	2	–	1		0	42612.85	(0.05)	1708
	2	–	1		1	42354.88	(0.10)	1708
	2	–	1		2	42096.70	(0.20)	1708
$^{117}Sn^{16}O$	2	–	1		0	42656.25	(0.10)	1708
$^{116}Sn^{16}O$	2	–	1		0	42700.40	(0.10)	1708
	2	–	1		1	42441.72	(0.10)	1708

PbS

Lead Sulfide

	$^{206}Pb^{32}S$		$^{208}Pb^{34}S$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	3491.6621(29)	a	3309.5609(50)	b
Y_{11} [MHz]	-13.0678(25)	a	-12.0590(25)	a
Y_{21} [MHz]	-0.0167(10)	a	-0.0150(10)	a
Y_{02} [kHz]	-1.019(30)	a	-0.915(30)	a
μ_r [amu]	27.6760935		29.1989414	

	$^{208}Pb^{32}S$		$^{207}Pb^{32}S$	
Constant	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	3487.1455(24)	c	3489.3921(27)	a
Y_{11} [MHz]	-13.0425(25)	c	-13.0551(25)	a
Y_{21} [MHz]	-0.0167(10)	c	-0.0167(10)	a
Y_{02} [kHz]	-1.016(30)	c	-1.017(30)	a
μ_0 [D]	3.59(10)	69014[d]		
μ_r [amu]	27.7119400		27.6940979	

[a]Calculated with isotopic relations from $^{208}Pb^{32}S$.

[b]Calculated from measurements of Ref. 73008.

[c]Recalculation of the data from Ref. 69014 and 1187.

[d]See also Ref. 69016.

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{208}Pb^{32}S$	1 – 0		0	6961.250	(0.02)	69014
	2 – 1		0	13922.460	(0.02)	69014
	2 – 1		1	13870.153	(0.02)	69014
	2 – 1		2	13817.695	(0.02)	69014
	2 – 1		3	13765.119	(0.02)	69014
	2 – 1		4	13712.400	(0.02)	1187
	2 – 1		5	13659.700	(0.02)	1187
	3 – 2		0	20883.607	(0.02)	69014
	3 – 2		1	20805.166	(0.02)	69014
	3 – 2		2	20726.508	(0.02)	69014
	3 – 2		3	20647.700	(0.10)	1187
	3 – 2		4	20568.900	(0.20)	1187
	4 – 3		0	27844.683	(0.02)	69014
	4 – 3		1	27740.083	(0.02)	69014
	4 – 3		2	27635.190	(0.04)	69014
	5 – 4		0	34805.693	(0.02)	69014
	5 – 4		1	34674.940	(0.02)	69014
	5 – 4		2	34543.843	(0.04)	69014
	6 – 5		0	41766.581	(0.02)	73012
	6 – 5		1	41609.629	(0.02)	73012
$^{207}Pb^{32}S$	2 – 1		0	13931.427	(0.02)	69014
	2 – 1		1	13879.063	(0.02)	69014
	2 – 1		2	13826.575	(0.02)	69014
	2 – 1		3	13773.900	(0.15)	1187
	3 – 2		0	20897.051	(0.02)	69014
	3 – 2		1	20818.526	(0.02)	69014
	3 – 2		2	20739.800	(0.10)	1187
	3 – 2		3	20660.950	(0.15)	1187
	4 – 3		0	27862.589	(0.02)	69014
	5 – 4		0	34828.108	(0.02)	69014
$^{206}Pb^{32}S$	2 – 1		0	13940.465	(0.02)	69014
	2 – 1		1	13888.058	(0.02)	69014
	2 – 1		2	13835.507	(0.02)	69014
	2 – 1		3	13782.860	(0.02)	69014
	3 – 2		0	20910.644	(0.02)	69014
	3 – 2		1	20832.000	(0.02)	69014
	3 – 2		2	20753.200	(0.10)	1187
	3 – 2		3	20674.350	(0.15)	1187
	4 – 3		0	27880.729	(0.02)	69014
	5 – 4		0	34850.738	(0.02)	69014
$^{208}Pb^{34}S$	2 – 1		0	13214.000	(0.20)	1187
	2 – 1		1	13165.300	(0.40)	1187
	3 – 2		0	19821.073	(0.02)	73012
	3 – 2		1	19748.509	(0.03)	73012
	6 – 5		0	39641.550	(0.02)	73012

PbSe

Lead Selenide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{208}Pb^{80}Se$	57.7324258	1516.9327(20)	-3.8932(10)	-3.62(15)	-0.195(12)	a
$^{208}Pb^{82}Se$	55.5451352	1576.6674(25)	-4.1286(15)	-3.91(15)	-0.211(12)	a
$^{208}Pb^{76}Se$	55.6169554	1574.6314(25)	-4.1174(15)	-3.90(15)	-0.210(12)	a
$^{206}Pb^{77}Se$	56.0051361	1563.7174(25)	-4.0747(15)	-3.85(15)	-0.207(12)	a
$^{207}Pb^{77}Se$	56.0789119	1561.6602(25)	-4.0667(15)	-3.84(15)	-0.207(12)	a
$^{208}Pb^{77}Se$	56.1521200	1559.6242(25)	-4.0587(15)	-3.83(15)	-0.206(12)	a
$^{206}Pb^{78}Se$	56.5320230	1549.1433(25)	-4.0179(15)	-3.78(15)	-0.203(12)	a
$^{207}Pb^{78}Se$	56.6071944	1547.0861(25)	-4.0100(15)	-3.77(15)	-0.203(12)	a
$^{208}Pb^{78}Se$	56.6817892	1545.0501(25)	-4.0019(15)	-3.76(15)	-0.202(12)	a
$^{206}Pb^{80}Se$	57.5770637	1521.0259(25)	-3.9090(15)	-3.64(15)	-0.196(12)	a
$^{207}Pb^{80}Se$	57.6550419	1518.9687(25)	-3.9010(15)	-3.63(15)	-0.196(12)	a
$^{206}Pb^{76}Se$	55.4727563	1578.7246(25)	-4.1335(15)	-3.92(15)	-0.211(12)	a
$^{206}Pb^{82}Se$	58.608085	1494.2683(25)	-3.8063(15)	-3.51(15)	-0.189(12)	a
$^{207}Pb^{82}Se$	58.688883	1492.2111(25)	-3.7984(15)	-3.50(15)	-0.189(12)	a
$^{208}Pb^{82}Se$	58.769069	1490.1751(25)	-3.7906(15)	-3.49(15)	-0.188(12)	a

Dipole Moment ($^{208}Pb^{80}Se$)

μ_0[D] 3.28(10) [70014]

[a]Recalculation of the data in Ref. 1497, whereby all isotopic species were fit simultaneously via the isotopic relations.

Isotopic Species	J′ ← J″	F′ F′1 ← F″ F″1	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{208}Pb^{80}Se$	3 – 2		0	9089.918	(0.02)	70014
	4 – 3		0	12119.88	(0.05)	1497
	4 – 3		1	12088.16	(0.05)	1497
	4 – 3		2	12057.39	(0.05)	1497
	4 – 3		3	12026.00	(0.05)	1497
	4 – 3		4	11994.72	(0.10)	1497
	4 – 3		5	11963.28	(0.10)	1497
	4 – 3		6	11931.81	(0.10)	1497
	4 – 3		7	11900.20	(0.10)	1497
	4 – 3		8	11868.49	(0.10)	1497
	4 – 3		9	11836.76	(0.10)	1497
	5 – 4		0	15149.83	(0.05)	1497
	8 – 7		0	24239.42	(0.05)	1497
	8 – 7		1	24177.02	(0.05)	1497
	8 – 7		2	24114.41	(0.05)	1497
	8 – 7		3	24051.81	(0.10)	1497
	8 – 7		4	23989.05	(0.10)	1497
	8 – 7		5	23926.26	(0.10)	1497
	8 – 7		6	23863.28	(0.10)	1497
	8 – 7		7	23800.13	(0.10)	1497
	9 – 8		0	27269.15	(0.05)	1497
	9 – 8		1	27198.91	(0.05)	1497
	9 – 8		2	27128.65	(0.05)	1497

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{208}Pb^{80}Se$	10 – 9		0	30298.89	(0.05)	1497
	10 – 9		1	30220.75	(0.10)	1497
$^{207}Pb^{76}Se$	4 – 3		0	12596.62	(0.10)	1497
	4 – 3		1	12563.63	(0.10)	1497
	8 – 7		0	25193.15	(0.10)	1497
$^{208}Pb^{76}Se$	4 – 3		0	12580.40	(0.05)	1497
	4 – 3		1	12547.50	(0.10)	1497
	4 – 3		2	12514.40	(0.19)	1497
	4 – 3		3	12481.31	(0.10)	1497
	8 – 7		0	25160.68	(0.05)	1497
	8 – 7		1	25094.57	(0.05)	1497
	8 – 7		2	25028.60	(0.10)	1497
	8 – 7		3	24962.31	(0.10)	1497
$^{206}Pb^{77}Se$	4 – 3		0	12493.39	(0.05)	1497
	8 – 7		0	24986.40	(0.05)	1497
$^{207}Pb^{77}Se$	4 – 3		0	12476.96	(0.05)	1497
	4 – 3		1	12444.27	(0.10)	1497
	8 – 7		0	24953.55	(0.05)	1497
	8 – 7		1	24888.24	(0.05)	1497
$^{208}Pb^{77}Se$	4 – 3		0	12460.75	(0.05)	1497
	4 – 3		1	12428.04	(0.05)	1497
	4 – 3		2	12395.47	(0.10)	1497
	8 – 7		0	24921.11	(0.05)	1497
	8 – 7		1	24855.97	(0.10)	1497
	8 – 7		2	24790.80	(0.10)	1497
	8 – 7		3	24725.53	(0.05)	1497
$^{206}Pb^{78}Se$	4 – 3		0	12377.01	(0.05)	1497
	8 – 7		0	24753.70	(0.05)	1497
	8 – 7		1	24689.25	(0.10)	1497
	8 – 7		2	24624.67	(0.10)	1497
$^{207}Pb^{78}Se$	4 – 3		0	12360.58	(0.05)	1497
	4 – 3		1	12328.45	(0.10)	1497
	8 – 7		0	24720.90	(0.05)	1497
	8 – 7		1	24656.56	(0.05)	1497
	8 – 7		2	24592.16	(0.05)	1497
	8 – 7		3	24527.65	(0.05)	1497
	8 – 7		4	24462.99	(0.10)	1497
$^{208}Pb^{78}Se$	4 – 3		0	12344.47	(0.05)	1497
	4 – 3		1	12312.30	(0.05)	1497
	4 – 3		2	12280.16	(0.05)	1497
	4 – 3		3	12247.89	(0.05)	1497
	4 – 3		4	12215.68	(0.10)	1497
	8 – 7		0	24688.44	(0.05)	1497
	8 – 7		1	24624.22	(0.05)	1497
	8 – 7		2	24560.00	(0.05)	1497
	8 – 7		3	24495.52	(0.10)	1497
	8 – 7		4	24431.00	(0.10)	1497
	9 – 8		0	27774.26	(0.10)	1497
$^{206}Pb^{80}Se$	4 – 3		0	12152.60	(0.05)	1497
	4 – 3		1	12121.20	(0.10)	1497
	4 – 3		2	12089.76	(0.10)	1497
	4 – 3		3	12058.29	(0.10)	1497
	4 – 3		4	12026.72	(0.10)	1497
	8 – 7		0	24304.77	(0.05)	1497
	8 – 7		1	24242.14	(0.05)	1497
	8 – 7		2	24179.37	(0.05)	1497
	8 – 7		3	24116.42	(0.10)	1497
	9 – 8		0	27342.73	(0.05)	1497
	9 – 8		1	27272.25	(0.05)	1497
$^{207}Pb^{80}Se$	4 – 3		0	12136.17	(0.05)	1497
	4 – 3		1	12104.77	(0.05)	1497
	4 – 3		2	12073.49	(0.05)	1497
	4 – 3		3	12042.06	(0.10)	1497
	4 – 3		4	12010.60	(0.10)	1497
	4 – 3		5	11979.20	(0.10)	1497
	4 – 3		6	11947.65	(0.10)	1497
	8 – 7		0	24271.91	(0.05)	1497
	8 – 7		1	24209.45	(0.05)	1497
	8 – 7		2	24146.66	(0.10)	1497
	8 – 7		3	24083.93	(0.10)	1497
	9 – 8		0	27305.76	(0.05)	1497
	9 – 8		1	27235.38	(0.05)	1497
$^{206}Pb^{76}Se$	4 – 3		0	12613.11	(0.10)	1497
	8 – 7		0	25226.05	(0.10)	1497
$^{206}Pb^{82}Se$	4 – 3		0	11938.85	(0.10)	1497
	4 – 3		1	11908.34	(0.10)	1497
	8 – 7		0	23877.44	(0.10)	1497
	8 – 7		1	23816.42	(0.10)	1497
$^{207}Pb^{82}Se$	4 – 3		0	11922.41	(0.10)	1497
	4 – 3		1	11891.96	(0.10)	1497
	8 – 7		0	23844.62	(0.10)	1497
	8 – 7		1	23783.73	(0.10)	1497
$^{208}Pb^{82}Se$	4 – 3		0	11906.20	(0.05)	1497

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{208}Pb^{82}Se$	4 – 3		1	11875.78	(0.10)	1497
	4 – 3		2	11845.33	(0.10)	1497
	8 – 7		0	23812.11	(0.05)	1497
	8 – 7		1	23751.30	(0.10)	1497

Lead Telluride

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{31}[kHz]	Y_{02}[kHz]	Ref.
$^{208}Pb^{130}Te$	79.9610302	298.5824(18)	-2.0216(7)	-1.68(15)	-0.011(8)	-0.080(16)	69017[a]
$^{208}Pb^{128}Te$	79.1980903	947.6241(20)	-2.0509(7)	-1.71(15)	-0.011(8)	-0.082(16)	b
$^{208}Pb^{126}Te$	78.4262384	956.9503(20)	-2.0812(7)	-1.74(15)	-0.012(8)	-0.083(16)	b
$^{208}Pb^{125}Te$	78.0374926	961.7174(20)	-2.0968(7)	-1.76(20)	-0.012(8)	-0.084(20)	b
$^{208}Pb^{124}Te$	77.6453425	966.5746(20)	-2.1127(8)	-1.78(17)	-0.012(8)	-0.085(20)	b
$^{208}Pb^{122}Te$	76.8552570	976.5112(20)	-2.1454(8)	-1.82(18)	-0.012(8)	-0.087(20)	b
$^{207}Pb^{130}Te$	79.8126611	940.3272(18)	-2.0272(7)	-1.69(15)	-0.011(8)	-0.080(16)	b
$^{207}Pb^{128}Te$	79.0525363	949.3688(18)	-2.0565(7)	-1.72(15)	-0.011(8)	-0.082(16)	b
$^{207}Pb^{126}Te$	78.2835052	958.6951(20)	-2.0869(7)	-1.75(15)	-0.012(8)	-0.083(16)	b
$^{207}Pb^{125}Te$	77.8961696	963.4622(20)	-2.1025(7)	-1.77(15)	-0.012(8)	-0.084(16)	b
$^{207}Pb^{124}Te$	77.5054350	968.3194(20)	-2.1184(7)	-1.79(17)	-0.012(8)	-0.085(20)	b
$^{206}Pb^{130}Te$	79.6633071	942.0901(18)	-2.0329(7)	-1.69(15)	-0.011(8)	-0.081(16)	b
$^{206}Pb^{128}Te$	78.9060111	951.1318(18)	-2.0623(7)	-1.73(15)	-0.011(8)	-0.082(16)	b
$^{206}Pb^{126}Te$	78.1398143	960.4581(20)	-2.0927(7)	-1.76(15)	-0.012(8)	-0.084(17)	b
$^{206}Pb^{125}Te$	77.7538959	965.2251(20)	-2.1083(7)	-1.78(15)	-0.012(8)	-0.085(16)	b
$^{206}Pb^{124}Te$	77.3645837	970.0823(20)	-2.1242(7)	-1.79(15)	-0.012(8)	-0.085(20)	b

Dipole Moment ($^{208}Pb^{130}Te$)

μ_0 [D] 2.73(10) [70014]

[a]Determined by least squares fit to all measured isotopic species via the isotopic relations.

[b]Calculated from the values for $^{208}Pb^{130}Te$ via the isotopic relations.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{208}Pb^{130}Te$	5 – 4		0	9375.672	(0.02)	70014
	6 – 5		0	11250.78	(0.06)	69017
	6 – 5		1	11226.47	(0.06)	69017
	6 – 5		2	11202.15	(0.06)	69017
	6 – 5		3	11177.80	(0.06)	69017
	6 – 5		4	11153.36	(0.06)	69017
	6 – 5		5	11128.87	(0.06)	69017
	6 – 5		6	11104.34	(0.06)	69017
	6 – 5		7	11079.85	(0.06)	69017
	6 – 5		8	11055.20	(0.06)	69017
	6 – 5		9	11030.50	(0.06)	69017
	6 – 5		0	11005.80	(0.09)	69017
	6 – 5		1	10981.01	(0.09)	69017
	6 – 5		2	10956.27	(0.09)	69017
	6 – 5		3	10931.47	(0.09)	69017
	8 – 7		0	15000.98	(0.06)	69017
	8 – 7		1	14968.49	(0.06)	69017
	8 – 7		2	14936.21	(0.06)	69017
$^{208}Pb^{128}Te$	6 – 5		0	11359.12	(0.06)	69017
	6 – 5		1	11334.45	(0.06)	69017
	6 – 5		2	11309.75	(0.06)	69017
	6 – 5		3	11285.02	(0.06)	69017
	6 – 5		4	11260.23	(0.06)	69017
	6 – 5		5	11235.40	(0.06)	69017
	6 – 5		6	11210.60	(0.06)	69017
	6 – 5		7	11185.60	(0.06)	69017
	6 – 5		8	11160.66	(0.06)	69017
	6 – 5		9	11135.65	(0.09)	69017
	6 – 5		0	11110.46	(0.09)	69017
	8 – 7		0	15145.44	(0.06)	69017
	8 – 7		1	15112.55	(0.06)	69017
	8 – 7		2	15079.60	(0.06)	69017
$^{208}Pb^{126}Te$	6 – 5		0	11470.85	(0.06)	69017
	6 – 5		1	11445.82	(0.06)	69017
	6 – 5		2	11420.76	(0.06)	69017
	6 – 5		3	11395.65	(0.06)	69017
	6 – 5		4	11370.52	(0.06)	69017
	6 – 5		5	11345.30	(0.06)	69017
	6 – 5		6	11320.04	(0.06)	69017
	6 – 5		7	11294.67	(0.06)	69017
$^{208}Pb^{125}Te$	6 – 5		0	11527.98	(0.06)	69017
	6 – 5		1	11502.75	(0.06)	69017
	6 – 5		2	11477.50	(0.06)	69017
	6 – 5		3	11452.24	(0.06)	69017
	6 – 5		4	11426.86	(0.09)	69017
$^{208}Pb^{124}Te$	6 – 5		0	11586.14	(0.06)	69017
	6 – 5		1	11560.73	(0.06)	69017
	6 – 5		2	11535.29	(0.06)	69017
	6 – 5		3	11509.81	(0.09)	69017
$^{208}Pb^{122}Te$	6 – 5		0	11705.14	(0.06)	69017
	6 – 5		1	11679.38	(0.09)	69017
$^{207}Pb^{130}Te$	6 – 5		0	11271.69	(0.06)	69017
	6 – 5		1	11247.31	(0.06)	69017
	6 – 5		2	11222.93	(0.06)	69017
	6 – 5		3	11198.47	(0.06)	69017
	6 – 5		4	11173.95	(0.06)	69017
	6 – 5		5	11149.43	(0.06)	69017
	6 – 5		6	11124.87	(0.06)	69017
	6 – 5		7	11100.26	(0.06)	69017
	8 – 7		0	15028.84	(0.06)	69017
$^{207}Pb^{128}Te$	6 – 5		0	11380.05	(0.06)	69017
	6 – 5		1	11355.32	(0.06)	69017
	6 – 5		2	11330.51	(0.06)	69017
	6 – 5		3	11305.68	(0.06)	69017
	6 – 5		4	11280.91	(0.06)	69017
	6 – 5		5	11255.97	(0.06)	69017
	6 – 5		6	11231.03	(0.06)	69017
	6 – 5		7	11206.06	(0.06)	69017
	6 – 5		8	11181.05	(0.09)	69017
	6 – 5		9	11155.95	(0.09)	69017
$^{207}Pb^{126}Te$	6 – 5		0	11491.76	(0.06)	69017
	6 – 5		1	11466.67	(0.06)	69017
	6 – 5		2	11441.53	(0.06)	69017
	6 – 5		3	11416.39	(0.06)	69017
	6 – 5		4	11391.16	(0.06)	69017
	6 – 5		5	11365.95	(0.09)	69017
$^{207}Pb^{125}Te$	6 – 5		0	11548.78	(0.06)	69017
	6 – 5		1	11523.47	(0.06)	69017
	6 – 5		2	11498.17	(0.09)	69017
$^{207}Pb^{124}Te$	6 – 5		0	11607.07	(0.06)	69017
	6 – 5		1	11581.60	(0.09)	69017
$^{206}Pb^{130}Te$	6 – 5		0	11292.83	(0.06)	69017
	6 – 5		1	11268.37	(0.06)	69017
	6 – 5		2	11243.88	(0.06)	69017

Isotopic Species	J′ ← J″	F′ F_1' ← F″ F_1''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{206}Pb^{130}Te$	6 – 5		3	11219.35	(0.06)	69017
	6 – 5		4	11194.78	(0.06)	69017
	6 – 5		5	11170.20	(0.06)	69017
	6 – 5		6	11145.52	(0.06)	69017
	6 – 5		7	11120.89	(0.06)	69017
	8 – 7		0	15056.96	(0.06)	69017
$^{206}Pb^{128}Te$	6 – 5		0	11401.17	(0.06)	69017
	6 – 5		1	11376.36	(0.06)	69017
	6 – 5		2	11351.51	(0.06)	69017
	6 – 5		3	11326.61	(0.06)	69017
	6 – 5		4	11301.68	(0.06)	69017
	6 – 5		5	11276.70	(0.06)	69017
$^{206}Pb^{126}Te$	6 – 5		0	11512.90	(0.06)	69017
	6 – 5		1	11487.75	(0.06)	69017
	6 – 5		2	11462.58	(0.06)	69017
	6 – 5		3	11437.32	(0.06)	69017
	6 – 5		4	11411.88	(0.06)	69017
	6 – 5		5	11386.67	(0.09)	69017
$^{206}Pb^{125}Te$	6 – 5		0	11570.00	(0.06)	69017
	6 – 5		1	11544.60	(0.06)	69017
	6 – 5		2	11519.20	(0.09)	69017

SSi

Silicon Sulfide

	$^{28}Si^{32}S$	$^{29}Si^{32}S$	$^{30}Si^{32}S$	$^{28}Si^{34}S$		$^{28}Si^{33}S$	
Constant	Value (Unc.)	Value (Unc.)	Value (Unc.)	Value (Unc.)	Ref.	Value (Unc.)	Ref.
Y_{01} [MHz]	9099.5365(12)	8932.1371(15)	8776.2492(15)	8850.0448(15)	72017	8970.820(5)	b
Y_{11} [MHz]	-44.1616(11)	-42.9485(13)	-41.8291(13)	-42.3577(13)	72017	-43.228(2)	b
Y_{21} [kHz]	-2.59(29)	-2.50(30)	-2.41(30)	-2.45(30)	72017	-2.52(30)	b
Y_{02} [kHz]	-5.997(59)	-5.778(60)	-5.578(60)	-5.673(60)	72017	-5.829(60)	b
$eq_0Q(S)$ [MHz]						+10.90(20)	70041
μ_0 [D]	+1.73(6)[a]				69018		
g_J [μ_n]	-0.09237(7)				73022		
μ_r [amu]	14.92068886	15.20033485	15.47034553	15.3413474		15.1347754	

[a]Note that the sign of the electric dipole moment has been determined in Ref. 72017 ($^{+}SiS^{-}$).

[b]Calculated from isotope $^{28}Si^{32}S$.

Additional references: 69016, 1311.

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{28}Si^{32}S$	1 – 0		0	18154.881	(0.02)	69018
	1 – 0		1	18066.554	(0.02)	69018
	1 – 0		2	17978.215	(0.02)	69018
	1 – 0		3	17889.856	(0.02)	69018
	1 – 0		4	17801.494	(0.03)	69018
	2 – 1		0	36309.631	(0.01)	72017
	2 – 1		1	36132.962	(0.01)	72017
	2 – 1		2	35956.270	(0.01)	72017
	2 – 1		3	35779.561	(0.01)	72017
	3 – 2		0	54464.081	(0.01)	72017
	3 – 2		1	54199.084	(0.01)	72017
	3 – 2		2	53934.052	(0.01)	72017
	3 – 2		3	53668.993	(0.01)	72017
	3 – 2		4	53403.889	(0.03)	72017
$^{29}Si^{32}S$	1 – 0		0	17821.309	(0.02)	72017
	1 – 0		1	17735.403	(0.02)	72017
	2 – 1		0	35642.465	(0.01)	72017
	2 – 1		1	35470.625	(0.04)	72017
	3 – 2		0	53463.348	(0.01)	72017
	3 – 2		1	53205.633	(0.03)	72017
$^{30}Si^{32}S$	1 – 0		0	17510.650	(0.02)	72017
	1 – 0		1	17426.971	(0.02)	72017
	2 – 1		0	35021.153	(0.01)	72017
	2 – 1		1	34853.818	(0.04)	72017
	3 – 2		0	52531.408	(0.01)	72017
	3 – 2		1	52280.392	(0.04)	72017
$^{28}Si^{34}S$	1 – 0		0	17657.718	(0.02)	72017
	1 – 0		1	17573.005	(0.02)	72017
	2 – 1		0	35315.283	(0.01)	72017
	2 – 1		1	35145.796	(0.04)	72017
	3 – 2		0	52972.575	(0.01)	72017
	3 – 2		1	52718.402	(0.03)	72017
$^{28}Si^{33}S$	1 – 0	1/2, 1/2 – 3/2 , 3/2	0	17895.673	(0.05)	70041
	1 – 0	5/2, 5/2 – 3/2 , 3/2	0	17897.874	(0.03)	70041
	1 – 0	3/2, 3/2 – 3/2 , 3/2	0	17900.584	(0.03)	70041

SSn

Tin Sulfide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{120}Sn^{32}S$	25.2414174	4103.0003(9)	-15.1564(7)	-6.61(20)	-1.268(33)	a
$^{122}Sn^{32}S$	25.3289537	4088.8204(10)	-15.0779(7)	-6.56(20)	-1.259(33)	b
$^{124}Sn^{32}S$	25.4142669	4075.0946(10)	-15.0020(7)	-6.52(20)	-1.251(33)	b
$^{119}Sn^{32}S$	25.1968562	4110.2565(10)	-15.1966(7)	-6.63(20)	-1.272(33)	b
$^{118}Sn^{32}S$	25.1515730	4117.6567(10)	-15.2377(7)	-6.66(20)	-1.277(33)	b
$^{117}Sn^{32}S$	25.1058212	4125.1605(10)	-15.2794(7)	-6.68(20)	-1.282(33)	b
$^{116}Sn^{32}S$	25.0593317	4132.8134(10)	-15.3219(7)	-6.71(20)	-1.286(33)	b
$^{120}Sn^{33}S$	25.8602467	4004.8165(10)	-14.6156(7)	-6.30(20)	-1.208(33)	b
$^{114}Sn^{32}S$	24.9646041	4148.4953(11)	-15.4092(10)	-6.76(20)	-1.296(33)	b
$^{112}Sn^{32}S$	24.8672951	4164.7289(10)	-15.4997(10)	-6.81(20)	-1.306(33)	b
$^{116}Sn^{34}S$	26.2690702	3942.4899(12)	-14.2758(10)	-6.10(20)	-1.171(33)	b
$^{118}Sn^{34}S$	26.3704504	3927.3331(10)	-14.1935(10)	-6.06(20)	-1.162(33)	b
$^{120}Sn^{34}S$	26.4692309	3912.6767(10)	-14.1141(10)	-6.01(20)	-1.153(33)	b

Dipole Moment ($^{120}Sn^{32}S$)

μ_0[D] 3.18(10) [69014[c]]

[a]Recalculation of the data in Ref. 69014.

[b]Calculated with isotopic relations from isotope $^{120}Sn^{32}S$.

[c]See also Ref. 69016.

Isotopic Species	J' ← J''	F' F$_1'$ ← F'' F$_1''$	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{120}Sn^{32}S$	2 − 1		0	16381.644	(0.01)	69014
	2 − 1		1	16320.963	(0.01)	69014
	2 − 1		2	16260.235	(0.01)	69014
	2 − 1		3	16199.457	(0.01)	69014
	2 − 1		4	16138.613	(0.01)	69014
	2 − 1		5	16077.715	(0.01)	69014
	3 − 2		0	24572.395	(0.01)	69014
	3 − 2		1	24481.376	(0.01)	69014
	3 − 2		2	24390.276	(0.01)	69014
	3 − 2		3	24299.093	(0.02)	69014
	3 − 2		4	24207.832	(0.02)	69014
	3 − 2		5	24116.496	(0.03)	69014
	4 − 3		0	32763.042	(0.01)	69014
	4 − 3		1	32641.684	(0.02)	69014
	4 − 3		2	35220.212	(0.03)	69014
	4 − 3		3	32398.636	(0.06)	69014
$^{122}Sn^{32}S$	2 − 1		0	16325.074	(0.01)	69014
	2 − 1		1	16264.698	(0.01)	69014
	3 − 2		0	24487.558	(0.01)	69014
	3 − 2		1	24397.006	(0.02)	69014
	4 − 3		0	32649.898	(0.04)	69014
$^{124}Sn^{32}S$	2 − 1		0	16270.341	(0.01)	69014
	2 − 1		1	16210.272	(0.01)	69014
	2 − 1		2	16150.158	(0.02)	69014
	3 − 2		0	24405.431	(0.01)	69014
	3 − 2		1	24315.334	(0.01)	69014
	3 − 2		2	24225.176	(0.03)	69014
	4 − 3		0	32540.412	(0.03)	69014
$^{119}Sn^{32}S$	2 − 1		0	16410.567	(0.01)	69014
	2 − 1		1	16349.742	(0.01)	69014
	2 − 1		2	16288.50	(0.20)	1314
$^{118}Sn^{32}S$	2 − 1		0	16440.110	(0.01)	69014
	2 − 1		1	16379.080	(0.01)	69014
	2 − 1		2	16318.043	(0.01)	69014
	2 − 1		3	16256.955	(0.02)	69014
	2 − 1		4	16195.755	(0.02)	69014
	3 − 2		0	24660.084	(0.01)	69014
	3 − 2		3	24385.320	(0.02)	69014
	3 − 2		4	24293.576	(0.03)	69014
	4 − 3		0	32879.972	(0.02)	69014
	4 − 3		1	32757.920	(0.03)	69014
	4 − 3		2	32635.840	(0.05)	69014
$^{117}Sn^{32}S$	2 − 1		0	16470.031	(0.01)	69014
	2 − 1		1	16408.860	(0.01)	69014
	2 − 1		2	16347.660	(0.02)	69014
	3 − 2		0	24704.960	(0.01)	69014
	3 − 2		1	24613.200	(0.01)	69014
	3 − 2		2	24521.388	(0.02)	69014
	4 − 3		0	32939.827	(0.03)	69014
$^{116}Sn^{32}S$	2 − 1		0	16500.561	(0.01)	69014
	2 − 1		0	16500.561	(0.01)	69014
	2 − 1		1	16439.225	(0.01)	69014
	2 − 1		2	16377.820	(0.01)	69014
	3 − 2		0	24750.765	(0.01)	69014
	3 − 2		1	24658.755	(0.01)	69014
	3 − 2		2	24566.648	(0.02)	69014
	3 − 2		3	24474.496	(0.02)	69014
	4 − 3		0	33000.864	(0.02)	69014
	4 − 3		1	32878.126	(0.08)	69014
$^{120}Sn^{33}S$	2 − 1	7/2 − 5/2	0	15989.887	(0.05)	70041
	2 − 1	5/2 − 3/2	0	15989.887	(0.05)	70041
$^{114}Sn^{32}S$	2 − 1		0	16563.20	(0.20)	1314
	3 − 2		0	24845.00	(0.20)	1314
$^{112}Sn^{32}S$	2 − 1		0	16627.866	(0.02)	69014
	3 − 2		0	24941.80	(0.20)	1314
	3 − 2		1	24848.70	(0.20)	1314
$^{116}Sn^{34}S$	3 − 2		0	23612.00	(0.20)	1314
$^{118}Sn^{34}S$	3 − 2		0	23521.40	(0.20)	1314
	3 − 2		1	23436.00	(0.20)	1314
$^{120}Sn^{34}S$	3 − 2		0	23433.80	(0.20)	1314
	3 − 2		1	23349.50	(0.20)	1314
	3 − 2		2	23265.00	(0.20)	1314

SeSi

Silicon Selenide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{28}Si^{80}Se$	20.7224706	5756.347(15)	-23.293(24)	+3(9)	-1.60(67)	a
$^{28}Si^{82}Se$	20.854510	5719.901(15)	-23.072(24)	+3(9)	-1.58(67)	a
$^{28}Si^{78}Se$	20.5855110	5794.645(15)	-23.526(24)	+3(9)	-1.62(67)	a
$^{28}Si^{76}Se$	20.4433616	5834.937(15)	-23.772(24)	+3(9)	-1.64(69)	a
$^{28}Si^{77}Se$	20.5152308	5814.496(15)	-23.647(24)	+3(9)	-1.63(68)	a
$^{29}Si^{80}Se$	21.2658341	5609.267(15)	-22.406(24)	+3(9)	-1.52(67)	a
$^{30}Si^{80}Se$	21.7981003	5472.299(15)	-21.590(24)	+3(9)	-1.44(67)	a
$^{29}Si^{78}Se$	21.1216230	5647.565(15)	-22.636(24)	+3(9)	-1.54(67)	a

Dipole Moment ($^{28}Si^{80}Se$)

μ_0[D] 1.1(2) [70041]

[a] Recalculation from the data in Ref. 1313 by a least squares fit to all measured isotopic species via the isotopic relations.

Isotopic Species	J′	←	J″	F′ F₁′ ← F″ F₁″	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{28}Si^{80}Se$	1	–	0		0	11489.44	(0.05)	1313
	1	–	0		1	11442.87	(0.05)	1313
	1	–	0		2	11396.35	(0.05)	1313
	1	–	0		3	11349.86	(0.10)	1313
	2	–	1		0	22978.69	(0.05)	1313
	2	–	1		1	22885.53	(0.05)	1313
	2	–	1		2	22792.37	(0.05)	1313
	3	–	2		0	34468.17	(0.05)	1313
	3	–	2		1	34328.47	(0.05)	1313
$^{28}Si^{82}Se$	1	–	0		0	11416.81	(0.05)	1313
	1	–	0		1	11370.71	(0.05)	1313
	1	–	0		2	11324.61	(0.10)	1313
	2	–	1		0	22833.46	(0.05)	1313
	2	–	1		1	22741.00	(0.05)	1313
	3	–	2		0	34249.86	(0.05)	1313
$^{28}Si^{78}Se$	1	–	0		0	11565.79	(0.05)	1313
	1	–	0		1	11518.77	(0.05)	1313
	1	–	0		2	11471.73	(0.05)	1313
	2	–	1		0	23131.43	(0.05)	1313
	2	–	1		1	23037.24	(0.05)	1313
	2	–	1		2	23943.24	(0.10)	1313
	3	–	2		0	34697.13	(0.05)	1313
	3	–	2		1	34556.13	(0.05)	1313
$^{28}Si^{76}Se$	1	–	0		0	11646.16	(0.05)	1313
	1	–	0		1	11598.69	(0.05)	1313
	2	–	1		0	23292.18	(0.05)	1313
	2	–	1		1	23197.08	(0.05)	1313
	3	–	2		0	34938.13	(0.05)	1313
	3	–	2		1	34795.49	(0.05)	1313
$^{28}Si^{77}Se$	1	–	0		0	11605.37	(0.05)	1313
	1	–	0		1	11558.04	(0.05)	1313
	2	–	1		0	23210.66	(0.05)	1313
	2	–	1		1	23115.98	(0.05)	1313
	3	–	2		0	34815.79	(0.05)	1313
$^{29}Si^{80}Se$	1	–	0		0	11196.18	(0.10)	1313
$^{30}Si^{80}Se$	1	–	0		0	10923.08	(0.10)	1313
$^{29}Si^{78}Se$	1	–	0		0	11272.42	(0.10)	1313

SeSn
Tin Selenide

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{02}[kHz]	Ref.
$^{120}Sn^{80}Se$	47.9543017	1948.5842(41)	-5.1211(43)	-2.8(11)	-0.302(28)	a
$^{120}Sn^{78}Se$	47.2271772	1978.5852(41)	-5.2398(44)	-2.9(12)	-0.311(29)	a
$^{120}Sn^{77}Se$	46.8588964	1994.1356(41)	-5.3017(43)	-2.9(11)	-0.316(28)	a
$^{120}Sn^{76}Se$	46.4856250	2010.1482(42)	-5.3657(45)	-3.0(12)	-0.321(30)	a
$^{120}Sn^{82}Se$	48.6673615	1920.0341(41)	-5.0090(43)	-2.7(11)	-0.293(28)	a
$^{124}Sn^{82}Se$	49.3140351	1894.8560(41)	-4.9108(43)	-2.6(11)	-0.286(28)	a
$^{124}Sn^{80}Se$	48.5820422	1923.4061(41)	-5.0222(43)	-2.7(11)	-0.294(28)	a
$^{124}Sn^{78}Se$	47.8359045	1953.4071(41)	-5.1401(43)	-2.8(11)	-0.303(28)	a
$^{122}Sn^{80}Se$	48.2712386	1935.7903(41)	-5.0707(43)	-2.8(11)	-0.298(28)	a
$^{122}Sn^{78}Se$	47.5345449	1965.7913(41)	-5.1891(43)	-2.8(11)	-0.307(28)	a
$^{119}Sn^{82}Se$	48.5019771	1926.5811(41)	-5.0346(43)	-2.7(11)	-0.295(28)	a
$^{119}Sn^{80}Se$	47.7937202	1955.1312(41)	-5.1469(43)	-2.8(11)	-0.304(28)	a
$^{119}Sn^{78}Se$	47.0714207	1985.1322(41)	-5.2659(43)	-2.9(11)	-0.313(28)	a
$^{119}Sn^{77}Se$	46.7055556	2000.6826(41)	-5.3278(43)	-3.0(11)	-0.318(28)	a
$^{119}Sn^{76}Se$	46.3347136	2016.6952(11)	-5.3919(43)	-3.0(11)	-0.323(28)	a
$^{118}Sn^{82}Se$	48.3344667	1933.2580(41)	-5.0608(43)	-2.8(11)	-0.297(28)	a
$^{118}Sn^{80}Se$	47.6310580	1961.8081(41)	-5.1733(43)	-2.8(11)	-0.306(28)	a
$^{118}Sn^{78}Se$	46.9136298	1991.8091(41)	-5.2924(43)	-2.9(11)	-0.316(28)	a
$^{118}Sn^{77}Se$	46.5502041	2007.3595(41)	-5.3545(43)	-3.0(11)	-0.320(28)	a
$^{118}Sn^{76}Se$	46.1818152	2023.3721(41)	-5.4187(43)	-3.0(11)	-0.326(28)	a
$^{117}Sn^{80}Se$	47.4672432	1296.5785(41)	-5.2001(43)	-2.9(11)	-0.308(28)	a
$^{117}Sn^{78}Se$	49.7547044	1998.5795(41)	-5.3194(43)	-2.9(11)	-0.318(28)	a
$^{117}Sn^{77}Se$	46.3937274	2014.1299(41)	-5.3817(43)	-3.0(11)	-0.323(28)	a
$^{117}Sn^{76}Se$	46.0278012	2030.1425(41)	-5.4460(43)	-3.0(11)	-0.329(28)	a
$^{116}Sn^{82}Se$	47.9949639	1946.9333(41)	-5.1146(43)	-2.8(11)	-0.301(28)	a
$^{116}Sn^{80}Se$	47.3013311	1975.4834(42)	-5.2275(44)	-2.9(11)	-0.310(28)	a
$^{116}Sn^{78}Se$	46.5937276	2005.4844(41)	-5.3470(43)	-3.0(11)	-0.320(28)	a
$^{116}Sn^{77}Se$	46.2352224	2021.0348(41)	-5.4094(43)	-3.0(11)	-0.325(28)	a
$^{116}Sn^{76}Se$	45.8717825	2037.0474(41)	-5.4738(43)	-3.1(11)	-0.330(28)	a

Dipole Moment ($^{120}Sn^{80}Se$)

μ_0[D] 2.82(9) [69020]

[a]Recalculation from the data in Ref. 1495 by a least squares fit to all measured isotopic species via the isotopic relations.

Isotopic Species	J' ← J''	F' F₁' ← F'' F₁''	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{120}Sn^{80}Se$	3 – 2		0	11676.160	(0.10)	1495
	3 – 2		1	11645.430	(0.10)	1495
	3 – 2		2	11614.520	(0.10)	1495
	3 – 2		3	11583.725	(0.10)	1495
	3 – 2		4	11552.860	(0.10)	1495
	3 – 2		5	11522.010	(0.10)	1495
	4 – 3		0	15568.130	(0.02)	69020
	6 – 5		0	23352.015	(0.10)	1495
	6 – 5		1	23290.650	(0.10)	1495
	8 – 7		0	31135.830	(0.10)	1495
	8 – 7		1	31053.800	(0.10)	1495
	8 – 7		2	30971.570	(0.10)	1495
	9 – 8		0	35027.600	(0.10)	1495
$^{120}Sn^{78}Se$	3 – 2		0	11855.630	(0.10)	1495
	3 – 2		1	11824.270	(0.10)	1495
	3 – 2		2	11792.810	(0.10)	1495
	3 – 2		3	11761.310	(0.10)	1495
	6 – 5		0	23711.370	(0.10)	1495
	8 – 7		0	31614.925	(0.10)	1495
$^{120}Sn^{77}Se$	3 – 2		0	11948.890	(0.10)	1495
	3 – 2		1	11917.285	(0.10)	1495
$^{120}Sn^{76}Se$	3 – 2		0	12044.830	(0.10)	1495
	3 – 2		1	12012.470	(0.10)	1495
	3 – 2		2	11980.000	(0.10)	1495
	8 – 7		0	32118.895	(0.10)	1495
	8 – 7		1	32032.650	(0.10)	1495
$^{120}Sn^{82}Se$	3 – 2		0	11505.180	(0.10)	1495
	3 – 2		1	11475.030	(0.10)	1495
	3 – 2		2	11444.920	(0.10)	1495
$^{124}Sn^{82}Se$	3 – 2		0	11354.460	(0.10)	1495
$^{124}Sn^{80}Se$	3 – 2		0	11525.375	(0.10)	1495
	3 – 2		1	11495.125	(0.10)	1495
	3 – 2		2	11464.820	(0.10)	1495
$^{124}Sn^{78}Se$	3 – 2		0	11704.920	(0.10)	1495
	8 – 7		0	31212.655	(0.10)	1495
$^{122}Sn^{80}Se$	3 – 2		0	11599.529	(0.10)	1495
	3 – 2		1	11569.000	(0.10)	1495
	6 – 5		0	23198.895	(0.10)	1495
$^{122}Sn^{78}Se$	3 – 2		0	11779.098	(0.10)	1495
$^{119}Sn^{82}Se$	3 – 2		0	11544.320	(0.10)	1495
$^{119}Sn^{80}Se$	3 – 2		0	11715.280	(0.10)	1495
	3 – 2		1	11684.420	(0.10)	1495
	3 – 2		2	11653.445	(0.10)	1495
	8 – 7		0	31240.350	(0.10)	1495
$^{119}Sn^{78}Se$	3 – 2		0	11894.880	(0.10)	1495
	3 – 2		1	11863.240	(0.10)	1495
$^{119}Sn^{77}Se$	3 – 2		0	11988.225	(0.10)	1495
$^{119}Sn^{76}Se$	3 – 2		0	12084.025	(0.10)	1495
$^{118}Sn^{82}Se$	3 – 2		0	11584.225	(0.10)	1495
	3 – 2		1	11553.850	(0.10)	1495
$^{118}Sn^{80}Se$	3 – 2		0	11755.280	(0.10)	1495
	3 – 2		1	11724.175	(0.10)	1495
	3 – 2		2	11693.120	(0.10)	1495
	3 – 2		3	11661.990	(0.10)	1495
	3 – 2		4	11630.800	(0.10)	1495
	4 – 3		0	15673.650	(0.10)	1495
	6 – 5		0	23510.350	(0.10)	1495
	8 – 7		0	31346.990	(0.10)	1495
	8 – 7		1	31264.125	(0.10)	1495
	8 – 7		2	31181.052	(0.10)	1495
$^{118}Sn^{78}Se$	3 – 2		0	11935.075	(0.10)	1495
	3 – 2		1	11903.530	(0.10)	1495
	6 – 5		0	23869.700	(0.10)	1495
$^{118}Sn^{77}Se$	3 – 2		0	12027.920	(0.10)	1495
	3 – 2		1	12995.680	(0.10)	1495
	8 – 7		0	32073.550	(0.10)	1495
$^{118}Sn^{76}Se$	3 – 2		0	12124.020	(0.10)	1495
	3 – 2		1	12091.400	(0.10)	1495
$^{117}Sn^{80}Se$	3 – 2		0	11795.780	(0.10)	1495
	3 – 2		1	11764.620	(0.10)	1495
	8 – 7		0	31455.080	(0.10)	1495
$^{117}Sn^{78}Se$	3 – 2		0	11975.380	(0.10)	1495
	3 – 2		1	11943.580	(0.10)	1495
$^{117}Sn^{77}Se$	3 – 2		0	12068.525	(0.10)	1495
$^{117}Sn^{76}Se$	3 – 2		0	12164.520	(0.10)	1495
$^{116}Sn^{82}Se$	3 – 2		0	11666.250	(0.10)	1495
$^{116}Sn^{80}Se$	3 – 2		0	11837.120	(0.10)	1495
	3 – 2		1	11805.890	(0.10)	1495
	3 – 2		2	11774.370	(0.10)	1495
	3 – 2		3	11742.820	(0.10)	1495
	6 – 5		0	23674.050	(0.10)	1495
	8 – 7		0	31565.320	(0.10)	1495
	8 – 7		1	31481.665	(0.10)	1495
	8 – 7		2	31397.740	(0.10)	1495

Isotopic Species	J′ ← J″	F′ F′₁ ← F″ F″₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{116}Sn^{78}Se$	3 − 2		0	12016.760	(0.10)	1495
	3 − 2		1	11984.670	(0.10)	1495
	3 − 2		2	11952.510	(0.10)	1495
$^{116}Sn^{77}Se$	3 − 2		0	12110.000	(0.10)	1495
	3 − 2		1	12077.385	(0.10)	1495
$^{116}Sn^{76}Se$	3 − 2		0	12205.830	(0.10)	1495
	3 − 2		1	12172.860	(0.10)	1495

SnTe

Tin Telluride

Isotopic Species	μ_r[amu]	Y_{01}[MHz]	Y_{11}[MHz]	Y_{21}[kHz]	Y_{31}[kHz]	Y_{02}[kHz]	Ref.
$^{120}Sn^{130}Te$	62.3519525	1273.4936(10)	-2.8609(10)	-1.60(42)	0.055(48)	-0.165(10)	68012[a]
$^{120}Sn^{128}Te$	61.8870658	1283.0599(10)	-2.8932(10)	-1.62(42)	0.055(48)	-0.167(10)	b
$^{120}Sn^{126}Te$	61.4147521	1292.9273(10)	-2.9266(10)	-1.65(45)	0.056(49)	-0.170(11)	b
$^{120}Sn^{125}Te$	61.1761054	1297.9710(11)	-2.9438(11)	-1.66(44)	0.057(50)	-0.171(11)	b
$^{120}Sn^{124}Te$	60.9348478	1303.1100(12)	-2.9613(12)	-1.68(44)	0.057(50)	-0.173(12)	b
$^{120}Sn^{122}Te$	60.4471768	1313.6232(12)	-2.9972(12)	-1.70(45)	0.059(48)	-0.176(12)	b
$^{118}Sn^{130}Te$	61.8065754	1284.7308(10)	-2.8988(10)	-1.63(42)	0.056(48)	-0.168(10)	b
$^{118}Sn^{128}Te$	61.3497558	1294.2971(10)	-2.9313(10)	-1.65(42)	0.056(48)	-0.170(10)	b
$^{118}Sn^{126}Te$	60.8855771	1304.1646(11)	-2.9649(12)	-1.68(44)	0.057(50)	-0.173(11)	b
$^{118}Sn^{125}Te$	60.6510174	1309.2082(12)	-2.9821(12)	-1.69(45)	0.057(50)	-0.174(12)	b
$^{118}Sn^{124}Te$	60.4138754	1314.3473(13)	-2.9997(13)	-1.70(45)	0.058(51)	-0.175(13)	b
$^{119}Sn^{130}Te$	62.0807435	1279.0570(10)	-2.8797(10)	-1.61(42)	0.055(48)	-0.166(10)	b
$^{119}Sn^{128}Te$	61.6198772	1288.6233(10)	-2.9120(10)	-1.64(42)	0.056(48)	-0.169(10)	b
$^{119}Sn^{126}Te$	61.1516176	1298.4908(11)	-2.9455(11)	-1.66(44)	0.057(50)	-0.171(11)	b
$^{116}Sn^{130}Te$	61.2525248	1296.3517(10)	-2.9383(10)	-1.66(42)	0.057(48)	-0.171(10)	b
$^{116}Sn^{128}Te$	60.8038288	1305.9180(12)	-2.9709(12)	-1.68(45)	0.057(50)	-0.173(12)	b
$^{116}Sn^{126}Te$	60.3478438	1315.7854(13)	-3.0046(13)	-1.71(45)	0.058(51)	-0.176(13)	b
$^{116}Sn^{125}Te$	60.1174011	1320.8291(13)	-3.0219(13)	-1.72(46)	0.059(52)	-0.177(13)	b
$^{117}Sn^{130}Te$	61.5310271	1290.4841(10)	-2.9183(10)	-1.64(42)	0.056(48)	-0.169(10)	b
$^{117}Sn^{128}Te$	61.0782567	1300.0504(12)	-2.9509(12)	-1.67(45)	0.057(50)	-0.172(12)	b
$^{117}Sn^{126}Te$	60.6181619	1309.9178(12)	-2.9845(12)	-1.69(45)	0.058(51)	-0.174(12)	b
$^{124}Sn^{130}Te$	63.417408	1252.0980(10)	-2.7891(10)	-1.55(42)	0.053(48)	-0.160(10)	b
$^{124}Sn^{128}Te$	62.9365591	1261.6643(10)	-2.8211(10)	-1.57(42)	0.054(48)	-0.162(10)	b
$^{124}Sn^{126}Te$	62.4481537	1271.5318(10)	-2.8543(10)	-1.60(42)	0.055(48)	-0.165(10)	b
$^{122}Sn^{130}Te$	62.8888365	1262.6217(10)	-2.8243(10)	-1.57(42)	0.055(48)	-0.162(10)	b
$^{122}Sn^{128}Te$	62.4159398	1272.1880(10)	-2.8565(10)	-1.60(42)	0.055(48)	-0.165(10)	b
$^{122}Sn^{126}Te$	61.9355504	1282.0555(10)	-2.8898(10)	-1.62(42)	0.055(48)	-0.167(10)	b

Dipole Moment ($^{120}Sn^{130}Te$)

μ_0[D] 2.19(9) [69020]

[a]Determined in Ref. 68012 by a least squares fit to all measured isotopic species via the isotopic relations.

[b]Calculated from the $^{120}Sn^{130}Te$ values via the isotopic relations.

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{120}Sn^{130}Te$	4 – 3		0	10176.460	(0.02)	69020
	5 – 4		0	12720.55	(0.04)	68012
	5 – 4		1	12691.91	(0.04)	68012
	5 – 4		2	12663.26	(0.04)	68012
	5 – 4		3	12634.54	(0.04)	68012
	5 – 4		4	12605.82	(0.04)	68012
	5 – 4		5	12577.13	(0.04)	68012
	5 – 4		6	12548.37	(0.04)	68012
	6 – 5		0	15264.62	(0.04)	68012
	6 – 5		1	15230.24	(0.04)	68012
	6 – 5		2	15195.85	(0.04)	68012
	6 – 5		3	15161.41	(0.04)	68012
	6 – 5		4	15126.97	(0.04)	68012
	6 – 5		5	15092.51	(0.04)	68012
	7 – 6		0	17808.70	(0.04)	68012
	7 – 6		1	17768.59	(0.04)	68012
	7 – 6		2	17728.43	(0.06)	68012
$^{120}Sn^{128}Te$	5 – 4		0	12816.03	(0.04)	68012
	5 – 4		1	12787.09	(0.04)	68012
	5 – 4		2	12758.12	(0.04)	68012
	5 – 4		3	12729.08	(0.04)	68012
	5 – 4		4	12700.03	(0.04)	68012
	6 – 5		0	15379.18	(0.04)	68012
	6 – 5		1	15344.47	(0.04)	68012
	6 – 5		2	15309.67	(0.04)	68012
	6 – 5		3	15274.83	(0.04)	68012
	6 – 5		4	15239.98	(0.04)	68012
	6 – 5		5	15205.16	(0.04)	68012
	7 – 6		0	17942.31	(0.04)	68012
	7 – 6		1	17901.82	(0.04)	68012
	7 – 6		2	17861.26	(0.06)	68012
$^{120}Sn^{126}Te$	5 – 4		0	12914.56	(0.04)	68012
	5 – 4		1	12885.26	(0.04)	68012
	5 – 4		2	12855.96	(0.04)	68012
	5 – 4		3	12826.61	(0.04)	68012
	6 – 5		0	15497.42	(0.04)	68012
	6 – 5		1	15462.25	(0.04)	68012
	6 – 5		2	15427.08	(0.04)	68012
	6 – 5		3	15391.83	(0.04)	68012
	7 – 6		0	18080.26	(0.04)	68012
	7 – 6		1	18039.27	(0.06)	68012
$^{120}Sn^{125}Te$	5 – 4		0	12964.89	(0.04)	68012
	5 – 4		1	12935.45	(0.04)	68012
	6 – 5		0	15557.80	(0.04)	68012
$^{120}Sn^{124}Te$	5 – 4		0	13016.23	(0.04)	68012
	5 – 4		1	12986.53	(0.04)	68012
	6 – 5		0	15619.40	(0.04)	68012
$^{120}Sn^{122}Te$	5 – 4		0	13121.16	(0.04)	68012
	6 – 5		0	15745.39	(0.04)	68012
$^{118}Sn^{130}Te$	5 – 4		0	12832.74	(0.04)	68012
	5 – 4		1	12803.70	(0.04)	68012
	5 – 4		2	12774.67	(0.04)	68012
	5 – 4		3	12745.60	(0.04)	68012
	5 – 4		4	12716.50	(0.04)	68012
	6 – 5		0	15399.21	(0.04)	68012
	6 – 5		1	15364.40	(0.04)	68012
	6 – 5		2	15329.52	(0.04)	68012
	6 – 5		3	15294.65	(0.04)	68012
	6 – 5		4	15259.79	(0.04)	68012
	6 – 5		5	15224.80	(0.04)	68012
	7 – 6		0	17965.67	(0.04)	68012
	7 – 6		1	17925.09	(0.06)	68012
	7 – 6		2	17884.47	(0.06)	68012
$^{118}Sn^{128}Te$	5 – 4		0	12928.24	(0.04)	68012
	5 – 4		1	12898.87	(0.04)	68012
	5 – 4		2	12869.52	(0.04)	68012
	5 – 4		3	12840.12	(0.04)	68012
	5 – 4		4	12810.69	(0.04)	68012
	6 – 5		0	15513.82	(0.04)	68012
	6 – 5		1	15478.59	(0.04)	68012
	6 – 5		2	15443.37	(0.04)	68012
	6 – 5		3	15408.11	(0.04)	68012
	6 – 5		4	15372.78	(0.04)	68012
	7 – 6		0	18099.45	(0.04)	68012
	7 – 6		1	18058.32	(0.06)	68012
	7 – 6		2	18017.11	(0.06)	68012
$^{118}Sn^{126}Te$	5 – 4		0	13026.74	(0.04)	68012
	5 – 4		1	12997.06	(0.04)	68012
	5 – 4		2	12967.34	(0.04)	68012
	5 – 4		3	12937.62	(0.04)	68012
	6 – 5		0	15632.01	(0.04)	68012
	6 – 5		1	15596.42	(0.04)	68012
	6 – 5		2	15560.72	(0.04)	68012
	7 – 6		0	18237.34	(0.04)	68012

Isotopic Species	J' ← J''	F' F'₁ ← F'' F''₁	v	Frequency (MHz)	(Unc.) (MHz)	Ref.
$^{118}Sn^{126}Te$	7 – 6		1	18195.78	(0.06)	68012
$^{118}Sn^{125}Te$	5 – 4		0	13077.09	(0.04)	68012
	5 – 4		1	13047.23	(0.04)	68012
	5 – 4		2	13017.35	(0.04)	68012
	6 – 5		0	15692.45	(0.04)	68012
	6 – 5		1	15656.61	(0.04)	68012
$^{118}Sn^{124}Te$	5 – 4		0	13128.36	(0.04)	68012
	6 – 5		0	15753.97	(0.04)	68012
$^{119}Sn^{130}Te$	5 – 4		0	12776.08	(0.04)	68012
	5 – 4		1	12747.27	(0.04)	68012
	6 – 5		0	15331.26	(0.04)	68012
	6 – 5		1	15296.67	(0.04)	68012
	7 – 6		0	17886.48	(0.06)	68012
$^{119}Sn^{128}Te$	5 – 4		0	12871.60	(0.04)	68012
	5 – 4		1	12842.43	(0.04)	68012
	6 – 5		0	15445.85	(0.04)	68012
	6 – 5		1	15410.90	(0.04)	68012
	6 – 5		2	15375.81	(0.04)	68012
	7 – 6		0	18020.05	(0.06)	68012
$^{119}Sn^{126}Te$	5 – 4		0	12970.10	(0.04)	68012
	6 – 5		0	15564.03	(0.04)	68012
$^{116}Sn^{130}Te$	5 – 4		0	12948.75	(0.04)	68012
	5 – 4		1	12919.35	(0.04)	68012
	5 – 4		5	12801.41	(0.06)	68012
	6 – 5		0	15538.46	(0.04)	68012
	6 – 5		1	15503.13	(0.04)	68012
	6 – 5		3	15432.44	(0.06)	68012
	6 – 5		4	15397.02	(0.06)	68012
	7 – 6		0	18128.07	(0.04)	68012
	7 – 6		1	18087.02	(0.06)	68012
	5 – 4		0	13044.22	(0.04)	68012
	5 – 4		1	13014.49	(0.04)	68012
	5 – 4		2	12984.76	(0.04)	68012
	5 – 4		3	12954.96	(0.04)	68012
	6 – 5		0	15653.02	(0.04)	68012
	6 – 5		1	15617.32	(0.04)	68012
	6 – 5		2	15581.62	(0.04)	68012
	7 – 6		0	18261.85	(0.04)	68012
	7 – 6		1	18220.25	(0.06)	68012
$^{116}Sn^{126}Te$	5 – 4		0	13142.75	(0.04)	68012
	5 – 4		1	13112.68	(0.04)	68012
	5 – 4		2	13082.50	(0.04)	68012
	6 – 5		0	15771.26	(0.04)	68012
	6 – 5		1	15735.14	(0.04)	68012
	6 – 5		2	15699.00	(0.04)	68012
	6 – 5		3	15662.89	(0.06)	68012
$^{116}Sn^{125}Te$	5 – 4		0	13193.10	(0.04)	68012
	6 – 5		0	15831.65	(0.04)	68012
$^{117}Sn^{130}Te$	5 – 4		3	12802.46	(0.04)	68012
	6 – 5		1	15433.03	(0.06)	68012
$^{117}Sn^{128}Te$	5 – 4		0	12985.65	(0.04)	68012
	5 – 4		1	12956.10	(0.04)	68012
	6 – 5		0	15582.74	(0.04)	68012
$^{117}Sn^{126}Te$	5 – 4		0	13084.15	(0.04)	68012
	6 – 5		0	15700.92	(0.04)	68012
	6 – 5		1	15665.10	(0.04)	68012
$^{124}Sn^{130}Te$	5 – 4		0	12506.95	(0.04)	68012
	6 – 5		0	15008.28	(0.04)	68012
	6 – 5		1	14974.76	(0.04)	68012
$^{124}Sn^{128}Te$	5 – 4		0	12602.49	(0.04)	68012
	6 – 5		0	15122.90	(0.04)	68012
$^{124}Sn^{126}Te$	5 – 4		0	12700.96	(0.04)	68012
	6 – 5		0	15241.08	(0.04)	68012
$^{122}Sn^{130}Te$	5 – 4		0	12612.02	(0.04)	68012
	6 – 5		0	15134.40	(0.04)	68012
	6 – 5		1	15100.42	(0.04)	68012
$^{122}Sn^{128}Te$	5 – 4		0	12707.53	(0.04)	68012
	6 – 5		0	15248.94	(0.04)	68012
	6 – 5		1	15214.66	(0.06)	68012
$^{122}Sn^{126}Te$	5 – 4		0	12806.02	(0.04)	68012
	6 – 5		0	15367.17	(0.04)	6801200

3. Equilibrium Internuclear Distances

When precise values for the Dunham coefficients, Y_{lj}, are obtained from experiment, the equilibrium internuclear distance can be determined from the equilibrium rotational constant B_e. Dunham [1][2] derived the following relationship between Y_{01} and B_e:

$$Y_{01}=B_e+(B_e^3/4\omega_e^2)[30+28a_1+21(a_1^2+a_1^3) -18a_2-46a_1a_2+30a_3], \quad (1)$$

where the a_i are the anharmonic potential constants that can be evaluated from the higher Y_{lj} coefficients. The equilibrium internuclear distance is then expressed as:

$$r_e=\left(\frac{h}{8\pi^2\mu_r B_e}\right)^{1/2}.$$

Since Dunham's treatment utilizes the Born-Oppenheimer approximation, the value of B_e must be modified for breakdown of this approximation. Several methods have been developed for handling these corrections; the most important are those of Rosenblum et al. [2], Bunker [3], and Watson [4].

The table of internuclear distances in this section list three types of r_e values. The values under the heading, r_e, were derived directly from Y_{01}, i.e. $Y_{01}\equiv B_e$ was assumed, or from the "Dunham corrected" value of B_e as shown in eq (1). When both the uncorrected value and "Dunham corrected" value are shown for a particular molecule, the uncorrected value is labeled, U, and the corrected value is labeled D. Unless otherwise stated, all unlabeled values under the heading r_e were derived from the uncorrected Y_{01}.

The second column of internuclear distances with the heading, r_e^{BO} were derived from equilibrium rotational constants which contain the Dunham correction of eq (1) and the modifications arising from breakdown in the Born-Oppenheimer approximation.

The uncertainties shown for all r_e values are based only on the uncertainty in the rotational constants and reduced masses employed in the calculations. In most cases the major contribution to the absolute uncertainty in r_e is due to the uncertainty in the fundamental physical constants. Thus, the conversion factor employed [5], $\frac{hN}{8\pi^2}=505390.98\pm3.5$ MHz amu · Å^2, produces an absolute error of 3.5 ppm for one standard deviation in the internuclear distance. All of the internuclear distances tabulated were calculated with this new conversion factor using the data from the sources referenced.

[2] Numbers in brackets indicate references in section 3.1.

3.1. References to Section 3

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[3] P. R. Bunker, J. Mol. Spectrosc. **28**, 422 (1968); **35**, 306 (1970).
[4] See ref. 73023 in section 4.
[5] Fundamental constants from B. N. Taylor, W. H. Parker, and D. N. Langenberg, Rev. Mod. Phys. **41**, 375 (1969).

Equilibrium Internuclear Distance

Isotopic Species	$r_e(\text{Å})^a$	$r_e^{BO}(\text{Å})^b$	Reference
AgBr	2.393138(3)		71000,1504
AgCl	2.2808190(2)	2.280815(3)	1534,1503,71000
AgF	1.983203(1)		70000
AgI	2.544651(3)		71000
AlBr	2.2948860(4)	2.294833(45)	72000,72006
AlCl	2.1301910(3)	2.130136(21)	72000,1344
AlF	1.6543883(4)		70001,72002,1344
AlI	2.5371326(3)		72000,73005
BF	1.2623(1)		71000
BaO	1.9397119(2)		1152,70005,73008
BrCl	2.136091(21)		50002
BrCs	3.0722875(24)		65,1019,72001, 73001
BrF	1.755747(85)		50001
BrGa	2.352519(32)		509
$^{79}Br^1H$	1.4146569(40)	1.414490(5)	166,230,520, 69000,71002
$^{79}Br^2H$	1.4144535(40)	1.414491(5)	
BrI	2.484801(72)		748
BrIn	2.543221(25)		509
BrK	2.820809(3)		53000,1019
BrLi	2.021491(3) U 2.021504(3) D		65,1019,1185
BrNa	2.5020676(9)		65,1019
BrO	1.7172(25)		69003,72012
BrRb	2.9447792(12)		65,1019
BrTl	2.6182148(80)		509,530,71007
CO	1.12833632(7)	1.1282427(6)	409,464,572, 70007,73023
CS	1.534960(30)		219,1100,73024
CSe	1.676198(64)	1.676086(64)	73002
ClCs	2.9063065(9)		53003,1171,72004, 73001
ClF	1.6283323(22)		259,49000
ClGa	2.2017159(22)		509,72005
$^{35}Cl^1H$	1.2745717(4)	1.2746181^c	71002,73023
$^{35}Cl^2H$	1.2745940(6)	$1.2746149(9)^d$	
$^{35}Cl^3H$	1.2746022(11)		
ClI	2.3209049(60)		47000,48001,72017
ClIn	2.4011967(17)		509,849,1448, 72008
ClK	2.6666830(7)		53001,138,1171
ClLi	2.0206913(2)	$2.020700(8)^d$ $2.020705(10)^c$	1210,68001,69004 73023
ClNa	2.3608225(12)		65, 1174
ClO	1.596(1)		69006
ClRb	2.7867690(14)		144,1171
ClTl	2.4848554(5)		509,530,1284
CsF	2.3453792(5)		65,1404,73001
CsI	3.3152313(10)		65,1019,72009, 73001
CuF	1.7449508(17)		70000
FGa	1.7743900(7)		70002
F^1H	0.91682	0.916905(X)	65006,68028, 70007,71002
F^2H	0.91737(14)		
FI	1.9097813(38)		73001

Equlibrium Internuclear Distance-Continued

Isotopic Species	$r_e(\text{Å})^a$	$r_e^{BO}(\text{Å})^b$	Reference
FIn	1.9854199(7)		69008,70002
FK	2.1714824(2) U 2.1714777(2) D		60000,1404,72019
FLi	1.5638785(3)	1.563884(15)	1153,69004
FNa	1.9259692(2) U 1.9259648(30) D		1404,63001
FRb	2.2703609(8)		58000,1404
FS	$1.6006(20)^e$		73003
FTl	2.0844623(1) U 2.0844557(10) D		1374,70002,72019
GaI	2.574689(31)		509
GeO	1.6246670(13)		1563
GeS	2.0120982(4)		1312,69009,70041
GeSe	2.1346561(8)		1496,70041
GeTe	2.3401928(9)		1632,71013
^1HI	1.609128(18)	1.609042(X)	230,520,68007, 71002
$^2H^7Li$	1.595271(16)	1.59492(2)	69011
^1HO	0.97998(X)		50000,62002
IIn	2.753672(19)		509,70038
IK	3.0478794(11) U 3.0478801(11) D		65,1019,73006
ILi	2.391944(16)		65,1019
INa	2.7114844(19)		65,1019
IRb	3.1769183(45)		65,1019
ITl	2.813709(7)		509,530,71007
NO	1.15074(10)		289,628,53006
NP	1.4908839(4)		72010,72015
NS	1.4941(3)		69013
O_2	1.207546(60)		915,51001,66006, 67005,68011,73017
OPb	1.9218359(12)		1241
OS	1.4811046(37)	1.480985(40)	1578,68027,73018, 73025
OSi	1.5097560(9)		68026
OSn	1.8325271(16)		1708
PbS	2.2868898(8)		1187,69014,73012
PbSe	2.4022637(16)		1497,70014
PbTe	2.595006(3)		69017,70014
SSi	1.92934401(13)	1.9292866(30)	69018,70041,72017
SSn	2.2090528(3)		1314,69014,70041
SeSi	2.0583513(30)		1313
SeSn	2.3256287(25)		1495
SnTe	2.5228436(11)		68012,69020

[a] Value of r_e determined from the uncorrected Y_{01}. In several cases the Dunham correction has been applied to Y_{01} in order to obtain B_e. When both r_e values are given the uncorrected value is labeled U and the value including the Dunham correction is labeled D.

[b] Value of r_e which includes all corrections to Y_{01} caused by the breakdown in the Born-Oppenheimer (BO) approximation.

[c] Obtained by the application of Bunker's technique.

[d] Obtained by Watson's method.

[e] The value shown is r_0.

4. References to Spectral Data

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Corrections added in proof:

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