Forschungszentrum Jülich

Institut für Chemie und Dynamik der Geosphäre 1:
Stratosphärische Chemie

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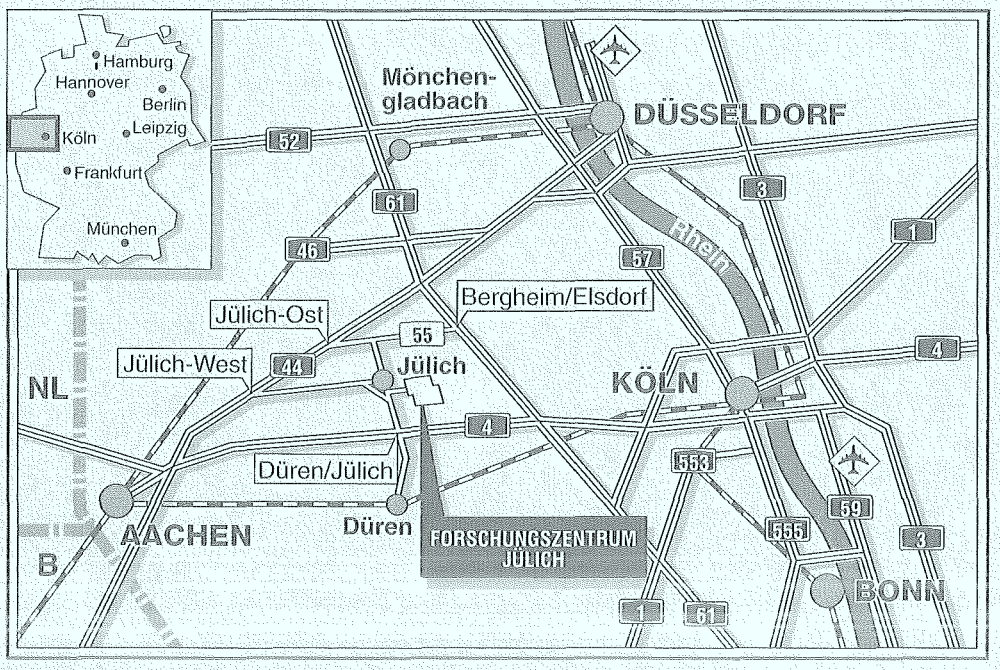
## Part 1: Inorganic Substances

*E.-P. Röth* *R. Ruhnke* *G. Moortgat*
*R. Meller* *W. Schneider*

Jül-3340

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# UV/VIS-Absorption Cross Sections and Quantum Yields for Use in Photochemistry and Atmospheric Modeling

## Part 1: Inorganic Substances

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*R. Meller*[3] *W. Schneider*[4]

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Stratosphärische Chemie, Forschungszentrum Jülich GmbH, Jülich

[2] now at Institut für Meteorologie und Klimaforschung, FZK, Karlsruhe

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[4] Euromap, Neustrelitz

## Contents

## Introduction

For theoretical considerations and for numerical determination of photolysis rates, knowledge of absorption spectra is essential. This is especially true for chemical models of the atmosphere, as all chemical reactions are driven directly or indirectly by the sun's radiation. Together with the wavelength dependent quantum yields of the respective photolysis processes, the absorption spectra govern the photodissociation frequencies. Therefore, these quantities are of highest interest to all atmospheric chemists.

Despite the importance of photodissociation processes, very few collections of absorption spectra in the visible and ultraviolet wavelength region are available. Moreover, most of these collections do not give the spectra in their original form, but tabulate selected data points with a rather poor resolution. The collection of gas phase absorption cross sections presented here originates from the data compiled at the Max Planck Institute for Chemistry used for kinetic purposes and from the collection used in the authors' atmospheric chemistry models at the Research Center Jülich. It is the aim to present all spectra as they were originally published, regardless of whether errors are obvious or not. Only in the case of typing errors or if corections were published later, the corrected values were included in this collection. All spectra are presented in the same format to simplify comparison and incorporation of the spectra into chemical models of the atmosphere.

The data presented here should be considered as a preliminary version of a data base of spectra and quantum yields of atmospheric relevant species. It is planed to provide an updated version in the near future, including new entries and possible corrections of the existing files. It is not our intention to give a recommendation at the moment, this may be the subject of a separate project. There are two volumes : the first treats the spectra of inorganic species, the second the organic compounds. A third volume with liquid phase spectra is planned to be published later.

The absorption spectra and the wavelength dependent quantum yields are both temperature dependent. The temperature dependencies in the atmospheric relevant temperature range from below 200 K to about 300 K have been included, where

available. Since the measurements were carried out at a limited number of temperatures, mathematical equations for interpolation were added. Together with the room temperature spectra, these equations for the temperature effect can be applied in atmospheric modeling in order to deduce the photolysis frequencies with sufficient accuracy.

Equations for the wavelength, temperature and pressure dependencies of the quantum yields are also presented. In most cases the measured data of quantum yields are rather disparate. Therefore, the mathematical formulas provide an adequate tool for an interpolation as a function of temperature, pressure and wavelength. Because the deviations between the observations of different laboratories exceed the statistical errors in most cases, it was not possible to combine all measurements into one equation. Therefore, each published set of data points was fitted separately.

In the following section, the format of the data sheets for the absorption spectra is described. Then,the procedure of the treatment of the temperature dependence of the spectra is explained. The description of the collected data closes with a section on the quantum yields together with an extensive explanation of the different interpolation formulas. On the data sheets for the absorption spectra, as well as for the quantum yields the parameters for the interpolation formula are given together with a number indicating the equation applied.

The data sheets are listed according to the ordering scheme of DeMore et al.[1]). For each molecule the spectra are arranged chronologically. They are provided with a code number in the extension of the filename for identification. The filename is identical with the molecule's name. Data used in the authors' models are indicated by an asterix ' * ' in the listing.

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[1]) DeMore et al., Chemical Kinetics and Photochemical Data for Use in Stratospheric Modeling, JPL Publication 94-26, 1994

It is obvious, that tables of the measured data points cannot be given here, as this would go beyond the limits of the publication. Therefore, the absorption spectra and the quantum yields are presented in the form of diagrams. The data themselves are compiled on diskettes which can be ordered from the address given below. These diskettes include a FORTRAN-program for the reading and for an interpolation of the data to variable wavelength increments.

Dr. Ernst-Peter Röth
Forschungszentrum-ICG1
D-52425 Jülich
Germany
Fax : (0) 201-183-3228
e-mail : e.p.roeth@kfa-juelich.de

## Absorption Cross Sections

The gas phase absorption spectra compiled in this collection are original measurements. As far as possible the cross sections were taken from tables or, if available, from electronic devices provided by the respective authors. Only if no tabulated data were given in the original literature, the data points were extracted from the original graph, making sure that all „critical points" are included in the digitized values. Such critical points are: the peaks and minima of the spectrum, also shoulders, and points where the slope of the absorbance changes. The source of the absorption spectra is indicated on the data sheets under 'Data :'. There are four different sources : Electronic media provided by the respective authors, indicated by 'disk'; tables ('table') and digitized diagrams ('diagram') in the original publication. The last source type 'formula' indicates, that the quantum yields were given by an mathematical expression in the original publication.

Each data sheet starts with the literature reference from which the spectrum originates. Where possible, data were taken from the original paper rather than from secondary literature. In some cases, the experimentalists also provided us with high resolution data sets. In these cases the cited publication gives the experimental details rather than the spectrum.

If the spectral resolution of the measurements were specified in the original paper, it is indicated on the data sheet, together with the temperature at which the presented absorption cross section was measured. In those cases, where a temperature dependence of the absorption spectrum was observed, the respective temperatures are indicated. Then the spectrum depicted on the first page represents the measurement at the highest temperature, typically room temperature. An example of such a diagram is given in Figure 1a. On the next page the spectra at the other temperatures are given along with an interpolation formula. These formulas were not given in the original papers, but determined for this compilation. The criteria for the determination are given below.

**Table 1:** Analytical functions used for the fitting of the temperature dependence of the absorption cross sections. $\lambda$ and T represent the wavelength and the temperature, respectively, and a-f are fitting parameters. $T_0$ is the reference temperature and the $\lambda_i$ are fixed reference wavelengths.

| | Fit Function $\alpha$ | $A_0$ / $B_0$ |
|---|---|---|
| 0 | $1$ | |
| 1 | $A_0 + \frac{1-A_0}{\exp[(c+d\cdot T)(\lambda-(e+f\cdot T))]+1}$ | $1+a(T_0-T)+b(T_0-T)^2$ |
| 2 | $1-A_0\exp[(c+d\cdot T)(\lambda-(e+f\cdot T))^2]$ | $a(T_0-T)+b(T_0-T)^2$ |
| 3 | $1-a(T_0-T)\cdot\exp[b(\lambda-\lambda_1)^2]-c(T_0-T)\cdot\exp[d(\lambda-\lambda_2)^2]$ | |
| 4 | $\exp[(a+b(T_0-T))\cdot(\lambda-(c+d\cdot T))]$ | |
| 5 | $\frac{A_0}{\exp[(c+d(T_0-T))\cdot(\lambda-(e+f\cdot T))]+1}$ | $a+b(T_0-T)$ |
| 6 | $A_0\exp[B_0(\lambda-\lambda_0)^2]+c[1-\exp(d(T_0-T))]\cdot\exp[e(\lambda-(\lambda_1+f(T_0-T)))^2]$ | $A_0=1+a(T_0-T)$<br>$B_0=\frac{-\ln(A_0)}{\lambda_{00}-\lambda_0}$ |

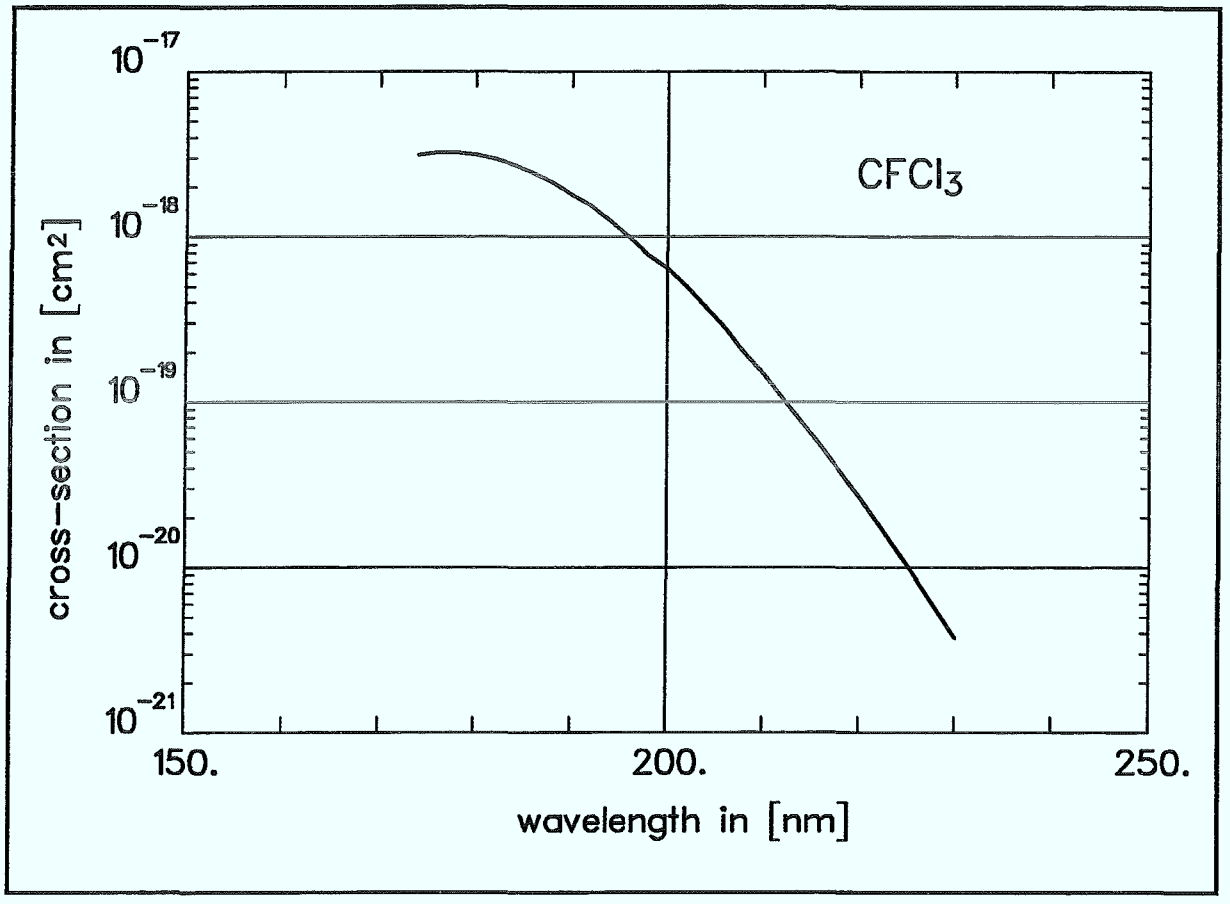
For the description of the temperature dependence six different fit functions were applied. These temperature equations are listed in Table 1. They define the quotient $\alpha$ of the absorption cross section at a temperature T to the specified reference temperature $T_0$ :

$$\sigma_T = \alpha \cdot \sigma_{T0}$$

The fitting parameters (a-f,$T_0$,$\lambda_i$) and the number of the respective function type are listed on the second page of the data sheets if a temperature dependence is given.

The fitting procedure is based on a "trial and error analysis". First, an appropriate function was selected and the quotient $\alpha$ (see above) for a specific temperature was fitted. Then, a linear expression for the temperature dependence of the parameters was chosen. Afterwards, the complete function was checked against all data at all temperatures.

**Figure 1a :** Example of the plot of an absorption cross section spectrum at the reference temperature.

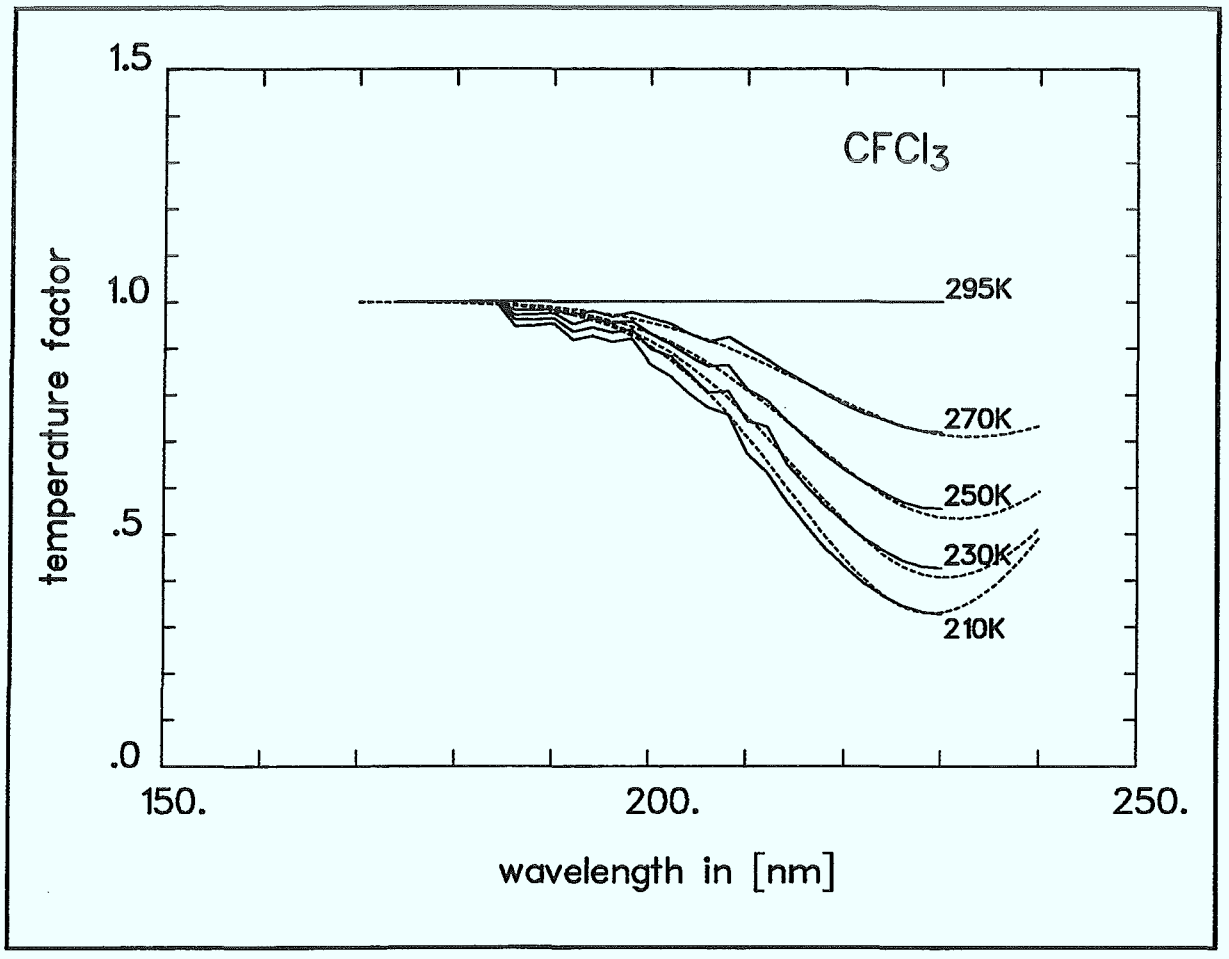



It was the aim to use functions with as few parameters as possible to achieve a moderate storage requirement. Therefore, larger deviations in those parts of the spectrum which contribute only little to the integrated photolysis frequency were accepted. E.g.: The wavelength region above 200 nm contributes much more to the stratospheric photodissociation processes than the region below 200 nm, due to the

small photon flux there. Consequently, we emphasized an accurate representation of the data above 200 nm. To indicate the deviations, the fit functions are plotted at selected temperatures together with the quotient $\sigma_T/\sigma_{T_0}$ of the experimental data, as shown in Figure 1b. *Note that these fit functions should not be applied for spectroscopic use, since they were determined only for the calculation of photolysis frequencies.*

Sometimes remarks are added to the spectra. These remarks give experimental details, e.g. it is indicated if the spectrum was observed in mixtures with other gases absorbing in the same wavelength regime.

**Figure 1b:** Example of the plot of the quotient $\alpha$ for the temperature dependence of the spectra. Dashed lines represent the respective fit functions



In the data files on the diskettes the experimental data of the cross sections are compiled for different temperatures. The fit functions are not included in these files. The first line of each file defines the molecule under consideration and the temperature at which the spectrum was measured. Then follows the literature reference in the same abreviated form as given in the listing. The full references can be found on the data sheets. The next two lines are the header and the units of the following data columns. The data are listed in three columns, each of them giving the wavelength in [nm] and the absorption cross section in [$cm^2$]. Table 2 shows an example of this format.

**Table 2:** Example of the format of the data files on the diskettes. The absorption cross sections and the quantum yields are given in the same format.

Substanz :S O 2 Temperatur : 295.

Zitat :Sidebottom etal,Env.Sci.Techn.6,72(72)

| lambda | sigma | lambda | sigma | lambda | sigma |
|---|---|---|---|---|---|
| nm | cm^2 | nm | cm^2 | nm | cm^2 |
| 218.00 | 9.080E-19 | 220.00 | 4.860E-19 | 226.70 | 1.540E-19 |
| 233.30 | 2.560E-20 | 240.00 | 5.120E-20 | 246.70 | 1.020E-19 |
| 253.30 | 2.050E-19 | 260.00 | 3.200E-19 | 266.70 | 5.120E-19 |
| 273.30 | 6.910E-19 | 280.00 | 8.830E-19 | 286.70 | 9.080E-19 |
| 293.30 | 7.550E-19 | 300.00 | 5.120E-19 | 306.70 | 3.200E-19 |
| 313.30 | 1.410E-19 | 320.00 | 3.840E-20 | 324.70 | 1.280E-20 |
| 339.30 | 3.840E-25 | 340.00 | 3.840E-23 | 341.00 | 3.840E-25 |
| 342.00 | 3.450E-23 | 342.70 | 1.150E-23 | 344.30 | 5.370E-23 |
| 345.70 | 7.680E-24 | 347.00 | 8.060E-23 | 348.30 | 1.540E-23 |
| 349.30 | 8.830E-23 | 350.30 | 6.520E-23 | 350.70 | 6.520E-23 |
| 352.00 | 3.840E-24 | 353.30 | 2.000E-22 | 355.30 | 5.370E-23 |
| 356.30 | 4.610E-23 | 358.30 | 1.880E-22 | 359.00 | 1.540E-22 |
| 359.70 | 1.920E-22 | 361.30 | 6.910E-23 | 363.70 | 2.230E-22 |
| 364.70 | 1.040E-22 | 365.70 | 1.340E-22 | 367.30 | 4.610E-23 |
| 370.00 | 3.650E-22 | 372.00 | 5.760E-23 | 373.00 | 6.910E-23 |
| 375.00 | 2.760E-22 | 377.00 | 6.520E-23 | 378.00 | 1.150E-22 |
| 379.70 | 3.070E-23 | 381.00 | 3.070E-23 | 383.00 | 2.300E-22 |

## Quantum Yields

If quantum yields for a photodissociation process were published, they are listed after the absorption cross sections of each individual molecule. As for the absorption spectra, the original measurements of the quantum yields are compiled on the diskettes. These files are given in the same format as the absorption cross sections (see Table 2). On the data sheets for the quantum yields fit functions are presented in the same way as the temperature dependencies of the absorption cross sections. In all cases the quantum yield can be expressed by a single Fermi-function or by a combination of Fermi-functions. This behavior is consistent with the physics of the photodissociation process. In Table 3 the functions for the temperature, wavelength, and pressure dependencies of the quantum yields are listed. The individual fitting parameters (A-F,$\lambda_i$) are given on the respective data sheets.

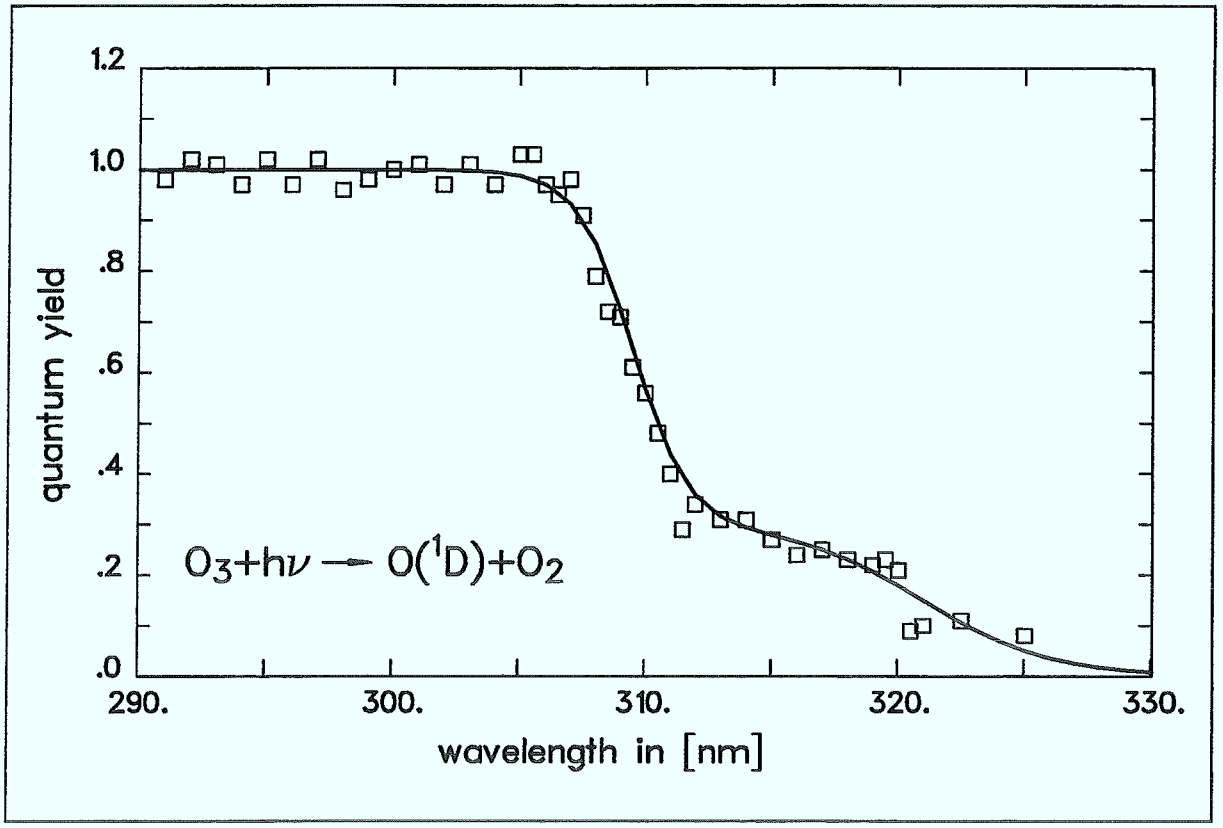
As for the absorption cross sections the fitting procedure for the quantum yields was carried out by a "trial and error" analysis. First the appropriate formula was selected and then the parameters were changed until a sufficient fit was achieved. A Fermi-function has only three parameters: the maximum value A, the reference wavelength $\lambda_o$ where the quantum yield equals A/2, and a parameter to define the slope of the curve. The parameters A and $\lambda_o$ can be read in directly from the diagram, a first guess for the slope parameter can be obtained by a "least square fit". Due to the scattering of the data this parameter has to be altered until the function represents the data with suffient accuracy. If a combination of functions is required, a stepwise fitting procedure is applied: First, the main features are fitted and afterwards the residue was represented by a mathematical expression. For the pressure and temperature dependencies a linear approximation is assumed. At the end, the accuracy of the pressure, temperature, and wavelength dependent fit function was checked. Figure 2 shows an example of the fit of the quantum yield of the reaction $O_3 + h\nu \rightarrow O(^1D) + O_2$.

**Table 3:** Different Fermi functions for the approximation of the measured quantum yields. λ, T, and M are wavelength, temperature, and air concentration. The fitting parameters A-F, and the reference wavelength $\lambda_i$ are given in the data sheets.

| | **Fit Function** |
|---|---|
| 1 | $A$ |
| 2 | $\frac{A}{\exp[B(\lambda-\lambda_1)]+1}$ |
| 3 | $\frac{A}{\exp[(B+C\cdot T)(\lambda-(D+E\cdot T))]+1}$ |
| 4 | $\frac{A}{1+\left(B-C\cdot\frac{T}{300}\right)\exp\left[\left(D-E\cdot\frac{T}{300}\right)(\lambda-F)\right]\frac{M}{10^{19}}}$ |
| 5 | $\frac{A}{\exp[B(\lambda-\lambda_1)]+1}\cdot\left\{1-\frac{C}{\exp[D(\lambda-\lambda_2)]+1}\right\}$ |
| 6 | $\frac{A}{1+B\cdot\exp[C(\lambda-D\cdot T)]\frac{M}{10^{38}}}$ |
| 7 | $\frac{A}{\exp[B(\lambda-\lambda_1)]+1}+\frac{C}{\exp[D(\lambda-\lambda_2)]+1}$ |

Only if no significant temperature dependence was observed, no fit function is given. In some cases, if there are several reaction channels for the photodissociation, only the quantum yields of the first one or two channels are described explicitely. The last channel is then represented by the combination of the preceeding functions for the other reaction paths. This is indicated under "Functions :" by the remark "Remaining term".

**Figure 2:** Fit for the quantum yield of the reaction $O_3 + h\nu \rightarrow O(^1D) + O_2$ as an example for the plots of quantum yields.



## Listing of the Data Sheets

In this listing the absorption cross sections and quantum yields are compiled in the same order as they appear in the following data sheets. The first two columns give the file name of the spectra available on diskettes. If the authors have measured spectra at more than one temperature, the respective spectra are not listed here, their numbers follow the number of the room temperature spectrum. Quantum yields are indicated by "_qy " added to the molecule's name. The references are given in an abreviated form, the full references including the title of the publication can be found on the data sheets. The asterix '*' mark those spectra used in the authors' models.

### Part 1 : Inorganic substances

Oxygen Species:

| | | | |
|---|---|---|---|
| | O2 | .001 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| | O2 | .002 | Ackerman etal, Planet.SpaceSci.18, 1639(1970) |
| | O2 | .003 | Ackerman in Fiocco "Mesospheric Models" (1971) |
| | O2 | .004 | Ogawa, J.Chem.Phys.54, 2550(1971) |
| | O2 | .005 | Kockarts, Planet.SpaceSci.24, 589(1976) |
| | O2 | .006 | Shardanand+Prasad Rao, JQuantSpecRadTransf17, 433(77) |
| | O2 | .007 | Frederick+Mentall, Geophys.Res.Lett.9, 461(1982) |
| | O2 | .010 | Johnston etal, J.Geophys.Res.89, 11661(1984) |
| * | O2 | .011 | Cheung etal, Planet.SpaceSci.34, 1007(1986) |
| | O2 | .012 | Jenouvrier etal, Planet.SpaceSci.34, 253(1986) |
| | O2 | .013 | Jenouvrier etal, J.Quant.Spec.Rad.Transf.36, 349(1986) |
| | O2 | .014 | Nicolet+Kennes, Planet.SpaceSci.34, 1043(1986) |
| * | O2 | .015 | Yoshino etal, Planet.SpaceSci.36, 1469(1988) |
| | O2 | .016 | Yoshino etal, Planet.SpaceSci.36, 1469(1988) |
| | O2 | .017 | Yoshino, pers. comm., 1991 |
| | O2 | .018 | Yoshino etal, Planet.SpaceSci.40, 182(1992) |
| | O2 | .019 | Greenblatt etal, NOAA, pers. comm., 1990 |

| | | | |
|---|---|---|---|
| | O3 | .001 | Vigroux, Compt.rend.234, 2439+2592(1952) |
| | O3 | .005 | Inn+Tanaka, J.Opt.Soc.Am.43, 870(1953) |
| | O3 | .006 | Hearn, Proc.Phys.Soc.78, 932(1961) |
| | O3 | .007 | DeMore+Raper, J.Phys.Chem.68, 412(1964) |
| | O3 | .008 | Griggs, J.Chem.Phys.49, 857(1968) |
| | O3 | .009 | Ackerman in Fiocco 'Mesospheric Models' (1971) |
| | O3 | .010 | Moortgat+Warneck, Z.Naturforsch.30a, 835(1975) |
| | O3 | .011 | Arnold etal, Chem.Phys.24, 211(1977) |
| | O3 | .012 | Fairchild+Lee, Chem.Phys.Lett.60, 36(1978) |
| | O3 | .013 | Bass+Paur, pers. comm., 1981 |
| | O3 | .015 | Astholz etal, J.Phys.Chem.86, 696(1982) |
| | O3 | .016 | Davenport, FAA-EE-80-44 R, 1982 |
| | O3 | .020 | Molina+Molina, J.Geophys.Res.91, 14501(1986) |
| | O3 | .023 | Cacciani etal, J.Geophys.Res.94, 8485(1989) |
| | O3 | .025 | Amoruso etal, J.Geophys.Res.95, 20565(1990) |
| | O3 | .027 | Anderson+Mauersberger, Geophys.Res.Lett.19, 933(1992) |
| * | O3 | .028 | Daumont etal, J.Atmos.Chem.15, 145(1992) |
| * | O3 | .032 | Malicet etal, J.Atmos.Chem.21, 263(1995) |
| | O3 | .033 | Anderson etal, Geophys.Res.Lett.20, 1579(1993) |
| * | O3 | .034 | Yoshino etal, J.Geophys.Res.98, 5205(1993) |
| * | O3 | .037 | Burkholder+Talukdar, Geophys.Res.Lett.21, 581(1994) |
| | O3 | .038 | Bass etal., pers.comm. |
| | O3 | .039 | Johnston, pers. comm. |
| | O3 | .040 | WMO (1975) |
| | O3_qy | .001 | Lin+DeMore, J.Photochem.2, 161(1973/74) |
| | O3_qy | .002 | Moortgat+Warneck, Z.Naturforsch.30a, 835(1975) |
| | O3_qy | .003 | Arnold etal, Chem.Phys.24, 211(1977) |
| | O3_qy | .004 | Moortgat etal, Farad.Trans.II73, 1216(1977) |
| | O3_qy | .005 | Moortgat etal, Farad.Trans.II73, 1216(1977) |
| | O3_qy | .006 | Moortgat etal, Farad.Trans.II73, 1216(1977) |
| | O3_qy | .007 | Moortgat etal, Farad.Trans.II73, 1216(1977) |
| | O3_qy | .008 | Philen etal, J.Chem.Phys.67, 3316(1977) |
| | O3_qy | .009 | NASA Ref.Pub.1010 (1977) |
| | O3_qy | .010 | Fairchild+Lee, Chem.Phys.Lett.60, 36(1978) |
| | O3_qy | .011 | Brock+Watson, Chem.Phys.46, 477(1980) |
| | O3_qy | .012 | Davenport, FAA-EE-80-44 R, 1982 |
| | O3_qy | .013 | Troiler+Wiesenfeld, J.Geophys.Res.93, 7119(1988) |
| | O3_qy | .014 | Ball etal, Geophys.Res.Lett.20, 2063(1993) |
| | O3_qy | .015 | Michelsen etal, Geophys.Res.Lett.21, 2227(1994) |

| | | | |
|---|---|---|---|
| | O3_qy | .016 | Michelsen etal, Geophys.Res.Lett.21, 2227(1994) |
| | O3_qy | .017 | Michelsen etal, Geophys.Res.Lett.21, 2227(1994) |
| | O3_qy | .018 | Michelsen etal, Geophys.Res.Lett.21, 2227(1994) |
| | O3_qy | .019 | Armerding etal, J.Phys.Chem.99, 3137(1995) |

**Hydrogen Species:**

| | | | |
|---|---|---|---|
| | HO2 | .001 | Kijewski+Troe, Int.J.Chem.Kin.3, 223(1971) |
| | HO2 | .002 | Hochanadel etal, J.Chem.Phys.56, 4426(1972) |
| | HO2 | .003 | Paukert+Johnston, J.Chem.Phys.56, 2824(1972) |
| | HO2 | .004 | Cox+Burrows, J.Phys.Chem.83, 2560(1979) |
| | HO2 | .005 | Kurylo etal, J.Photochem.39, 201(1987) |
| | HO2 | .006 | McAdam etal, Chem.Phys.Lett.133, 39(1987) |
| | HO2 | .007 | Moortgat etal, J.Phys.Chem.93, 2362(1989)) |
| * | HO2 | .008 | Crowley etal, J.Photochem.Photobiol.60, 1(1991) |
| | HO2 | .009 | Jenkin+Cox, J.Photochem.Photobiol.60, 1(1991) |
| | HO2 | .010 | Lightfoot+Jemi-Alade, J.Photochem.Photobiol.59, 1(1991) |
| | H2O | .001 | Watanabe+Zelikoff, J.Opt.Soc.Am.43, 753(1953) |
| | H2O | .002 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| | H2O | .003 | Schuergers+Welge, Z.Naturforsch.23a, 1508(1968) |
| * | H2O | .004 | Hochanadel etal, J.Chem.Phys.56, 4426(1972) |
| | H2O2 | .001 | Holt etal, J.Chem.Phys.16, 225(1948) |
| | H2O2 | .002 | Schumb etal "Hydrogen Peroxide" p.291 (1955) |
| | H2O2 | .003 | Schuergers+Welge, Z.Naturforsch.23a, 1508(1968) |
| | H2O2 | .004 | Troe, Ber.Bunsenges.73, 946(1969) |
| | H2O2 | .005 | Hochanadel etal, J.Chem.Phys.56, 4426(1972) |
| | H2O2 | .006 | Molina etal, Geophys.Res.Lett.4, 580(1978) |
| | H2O2 | .007 | Lin etal, Geophys.Res.Lett.5, 113(1978) |
| | H2O2 | .008 | Molina+Molina, J.Photochem.15, 97(1981) |
| | H2O2 | .010 | Nicovich+Wine, J.Geophys.Res.93, 2417(1988) |
| * | H2O2 | .014 | Vaghjiani+Ravinshankara, J.Geophys.Res.94, 3487(1989) |

**Nitrogen Species:**

| | | | |
|---|---|---|---|
| * | NO | .001 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| | NO2 | .001 | Holmes+Daniels, J.Am.Chem.Soc.56, 630(1934) |
| | NO2 | .002 | Dixon, J.Chem.Phys.8, 157(1940) |
| | NO2 | .003 | Hall+Blacet, J.Chem.Phys.20, 1745(1952) |
| | NO2 | .004 | Nakayama etal, J.Chem.Phys.30, 1180(1959) |

| | | | |
|---|---|---|---|
| | NO2 | .005 | Harker etal, Chem.Phys.Lett.50, 394(1977) |
| | NO2 | .006 | Jones+Bayes, J.Chem.Phys.59, 4836(1973) |
| | NO2 | .007 | Johnston etal, J.Phys.Chem.78, 1(1974) |
| | NO2 | .008 | Johnston+Graham, Can.J.Chem.52, 1415(1974) |
| * | NO2 | .009 | Bass etal, J.Res.NBS80a, 143(1976) |
| * | NO2 | .011 | Schneider etal, J.Photochem.Photobiol.40, 195(1987) |
| | NO2 | .012 | Schneider+Moortgat, MPI Mainz, 1986 |
| | NO2 | .013 | Schneider+Moortgat, MPI Mainz, 1986 |
| | NO2 | .014 | Davidson etal, J.Geophys.Res.93, 7105(1988) |
| | NO2 | .017 | Amoruso etal, J.Geophys.Res.98, 16857(1993) |
| | NO2 | .019 | Harwood+Jones, J.Geophys.Res.99, 22955(1994) |
| | NO2 | .027 | Coquart etal, J.Atmos.Chem.21, 251(1995) |
| | NO2 | .030 | W.Kummer, Diploma-Thesis, Uni Essen, Germany, 1995 |
| | NO2_qy | .001 | Jones+Bayes, J.Chem.Phys.59, 4836(1973) |
| | NO2_qy | .002 | Harker etal, Chem.Phys.Lett.50, 394(1977) |
| | NO2_qy | .003 | NASA Panel Data Evaluation 1985 |
| | NO2_qy | .004 | NASA Panel Data Evaluation 1992 |
| | NO2_qy | .005 | Roehl etal, J.Phys.Chem.98, 7837(1994) |
| | NO2_qy | .006 | Roehl etal, J.Phys.Chem.98, 7837(1994) |
| | | | |
| | NO3 | .001 | Johnston+Graham, Can.J.Chem.52, 1415(1974) |
| | NO3 | .002 | NASA Ref.Pub.1010 (1977) |
| | NO3 | .003 | Graham+Johnston, J.Phys.Chem.82, 254(1978) |
| | NO3 | .004 | Marinelli etal, J.Chem.Phys.76, 2864(1982) |
| | NO3 | .005 | Ravishankara+Wine, Chem.Phys.Lett.101, 73(1983) |
| | NO3 | .006 | Ravinshankara+Mauldin, J.Geophys.Res.91, 8709(1986) |
| * | NO3 | .007 | Sander, J.Phys.Chem.90, 4135(1986) |
| | NO3 | .009 | Burrows etal, J.Phys.Chem.89, 4848(1989) |
| | NO3_qy | .001 | Magnotta+Johnston, Geophys.Res.Lett.7, 769(1980) |
| | NO3_qy | .002 | Magnotta+Johnston, Geophys.Res.Lett.7, 769(1980) |
| | NO3_qy | .003 | Magnotta+Johnston, Geophys.Res.Lett.7, 769(1980) |
| | | | |
| | N2O | .001 | Romand+Mayence, Compt.Rend.228, 998(1949) |
| | N2O | .002 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| | N2O | .003 | Nicolet+Peetermans, Ann.Geophys.28, 751(1972) |
| | N2O | .004 | Nicolet, pers. comm., 1983 |
| | N2O | .005 | Johnston+Graham, Can.J.Chem.52, 1415(1974) |
| * | N2O | .006 | Johnston+Selwyn, Geophys.Res.Lett.2, 549(1975) |
| | N2O | .007 | Selwyn etal, Geophys.Res.Lett.4, 427(1977) |
| | N2O | .012 | Sundararaman, FAA.EQ-77-2 |

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|---|---|---|---|
| * | N2O | .013 | Hubrich+Stuhl, J.Photochem.12, 93(1980) |
| | N2O | .015 | Merienne etal, Planet.SpaceSci.38, 617(1990) |
| * | N2O4 | .001 | Bass etal, J.Res.NBS80a, 143(1976) |
| | N2O4 | .002 | Harwood+Jones, J.Geophys.Res.99, 22955(1994) |
| | N2O5 | .001 | Holmes+Daniels, J.Am.Chem.Soc.56, 630(1934) |
| | N2O5 | .002 | Jones+Wulf, J.Chem.Phys.5, 873(1937) |
| | N2O5 | .003 | Johnston etal, J.Phys.Chem.78, 1(1974) |
| * | N2O5 | .004 | Johnston+Graham, Can.J.Chem.52, 1415(1974) |
| | N2O5 | .005 | NASA Ref.Pub.1010 (1977) |
| | N2O5 | .006 | Yao etal, J.Phys.Chem.86, 3611(1982) |
| | HNO2 | .001 | Johnston+Graham, Can.J.Chem.52, 1415(1974) |
| | HNO2 | .002 | Cox+Derwent, J.Photochem.6, 23(1976) |
| | HNO2 | .003 | NASA Ref.Pub.1010 (1977) |
| | HNO2 | .004 | Perner, KFA Juelich, 1977 |
| | HNO2 | .005 | Stockwell+Calvert, J.Photochem.8, 193(1978) |
| | HNO2 | .006 | Vasudev, Geophys.Res.Lett.17, 2153(1990) |
| * | HNO2 | .007 | Bongartz etal, J.Phys.Chem.95, 1076(1991)/corrJAC(1994) |
| | HNO3 | .001 | Johnston+Graham, J.Phys.Chem.77, 62(1973) |
| * | HNO3 | .002 | Biaume, J.Photochem.2, 139(1973) |
| | HNO3 | .003 | Johnston etal, J.Phys.Chem.78, 1(1974) |
| | HNO3 | .004 | Johnston+Graham, Can.J.Chem.52, 1415(1974) |
| | HNO3 | .005 | Okabe, J.Chem.Phys.72, 6642(1980) |
| | HNO3 | .006 | Molina+Molina, J.Photochem.15, 97(1981) |
| | HNO3 | .007 | Suto+Lee, J.Chem.Phys.81, 1294(1984) |
| * | HNO3 | .008 | Rattigan etal, Ber.Bunsenges.96, 399(1992) |
| | HNO3 | .010 | Burkholder etal, J.Geophys.Res.98, 22937(1993) |
| | HNO4 | .001 | Graham etal, Geophys.Res.Lett.5, 909(1978) |
| | HNO4 | .002 | Cox+Patrick, Int.J.Chem.Kin.11, 635(1979) |
| | HNO4 | .003 | Morel etal, Chem.Phys.Lett.73, 38(1980) |
| | HNO4 | .004 | Molina+Molina, FAA-EE-80-07 (1980) |
| * | HNO4 | .005 | Singer etal, J.Photochem.Photobiol.48, 17(1989) |
| | NH3 | .001 | Watanabe, J.Chem.Phys.22, 1564(1954) |
| * | NH3 | .002 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| | NF3 | .001 | Molina etal, Geophys.Res.Lett.22, 1873(1995) |

**Chlorine Species:**

| | | | |
|---|---|---|---|
| | Cl2 | .001 | vonHalban+Siedentopf, Z.Elektrochemie28, 496(1922) |
| | Cl2 | .002 | Gibson+Bayliss, Phys.Rev.44, 188(1933) |
| | Cl2 | .008 | Jones+Spooner, Trans.FaradaySoc.31, 811(1935) |
| | Cl2 | .009 | Aickin+Bayliss, Trans.FaradaySoc.33, 1333(1937) |
| | Cl2 | .015 | Martin+Gareis, Z.Elektrochem.60, 959(1956) |
| | Cl2 | .016 | Seery+Britton, J.Phys.Chem.68, 2263(1964) |
| | Cl2 | .017 | Knauth etal, J.Phys.Chem.83, 1604(1979) |
| | Cl2 | .018 | Roxlo+Mandl, J.Appl.Phys51, 2969(1980) |
| | Cl2 | .019 | Burkholder+Bair, J.Phys.Chem.87, 1859(1983) |
| | Cl2 | .021 | Ganske etal, J.Geophys.Res.97, 7651(1992) |
| * | Cl2 | .022 | Maric etal, J.Photochem.Photobiol.70, 205(1993) |
| | Cl2 | .023 | Maric etal, J.Photochem.Photobiol.70, 205(1993) |
| | Cl2 | .024 | Maric etal, J.Photochem.Photobiol.70, 205(1993) |
| | Cl2 | .025 | Hubinger+Nee, J.Photochem.Photobiol.86, 1(1995) |
| | | | |
| | ClO | .001 | Johnston etal, J.Am.Chem.Soc.91, 7712(1969) |
| | ClO | .002 | Mandelman+Nicholls, JQuantSpecRadTransf17, 483(1977) |
| | ClO | .003 | Rigaud etal, Chem.Phys.Lett.46, 161(1977) |
| | ClO | .004 | Jourdain etal, Chem.Phys.Lett.57, 109(1978) |
| | ClO | .005 | Sander+Friedl, J.Phys.Chem.93, 4764(1989) |
| * | ClO | .006 | Simon etal, J.Photochem.Photobiol.A55, 1(1990) |
| | ClO | .007 | Trolier etal, J.Phys.Chem.94, 4896(1990) |
| | | | |
| * | ClOO | .001 | Johnston etal, J.Am.Chem.Soc.91, 7712(1969) |
| | ClOO | .002 | Baer etal, J.Chem.Phys.95, 6463(1991) |
| | ClOO | .003 | Mauldin etal, J.Phys.Chem.96, 2582(1992) |
| | | | |
| | OClO | .001 | Martin+Gareis, Z.Elektrochem.60, 959(1956) |
| | OClO | .002 | Knauth etal, J.Phys.Chem.83, 1604(1979) |
| * | OClO | .003 | Wahner etal, J.Phys.Chem.91, 2734(1987) |
| | | | |
| | Cl2O | .001 | Goodeve+Wallace, Trans.FaradaySoc.26, 254(1930) |
| * | Cl2O | .002 | Finkelnburg etal, Z.Phys.Chem.15, 127(1931) |
| | Cl2O | .003 | Martin+Gareis, Z.Elektrochem.60, 959(1956) |
| | Cl2O | .004 | Lin, J.Chem.Eng.Data21, 411(1976) |
| | Cl2O | .005 | Molina+Molina, J.Phys.Chem.82, 2410(1978) |
| | Cl2O | .006 | Knauth etal, J.Phys.Chem.83, 1604(1979) |
| | Cl2O | .008 | Simon etal, J.Photochem.Photobiol.A55, 1(1990) |

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|---|---|---|---|
| | Cl2O | .009 | Simon, PhD-Thesis,1989 |
| | Cl2O | .010 | Nee, J.Quant.Spect.Rad.Transf.46, 55(1991) |
| | Cl2O2 | .001 | Molina etal, J.Phys.Chem.91, 433(1987) |
| | Cl2O2 | .002 | Cox+Hayman, Nature332, 796(1988) |
| | Cl2O2 | .003 | Permien etal, AirPoll.Res.Rep.17, 149(1988) |
| | Cl2O2 | .004 | Burkholder etal, J.Phys.Chem.94, 687(1990) |
| * | Cl2O2 | .005 | Burkholder etal, NOAA (1988) |
| | Cl2O2 | .006 | DeMore+Tschuikow-Roux, J.Phys.Chem.94, 5856(1990) |
| | Cl2O2 | .007 | Vogt+Schindler, AirPoll.Res.Rep.34, 167(1990) |
| * | Cl2O3 | .001 | Hayman+Cox, Chem.Phys.Lett.155, 1(1989) |
| * | Cl2O4 | .001 | Lopez+Sicre, J.Phys.Chem.92, 563(1988) |
| * | Cl2O6 | .001 | Lopez+Sicre, J.Phys.Chem.94, 3860(1990) |
| * | ClClO2 | .001 | Müller+Willner, Ber.Bunsenges.96, 427(1992) |
| | HCl | .001 | Romand+Vodar, Compt.rend.228, 238(1948) |
| | HCl | .002 | Myer+Samson, J.Chem.Phys.52, 266(1970) |
| * | HCl | .003 | Inn, J.Atmos.Sci.32, 2375(1975) |
| | HOCl | .001 | Molina+Molina, J.Phys.Chem.82, 2410(1978) |
| * | HOCl | .002 | Knauth etal, J.Phys.Chem.83, 1604(1979) |
| | HOCl | .003 | Mishalanie etal, J.Phys.Chem.90, 5578(1986) |
| | HOCl | .004 | Permien, AirPoll.Res.Rep.17, 149(1988) |
| | HOCl | .005 | Burkholder, J.Geophys.Res.98, 2963(1993) |
| | HOCl | .006 | Jungkamp et al., J.Photochem.Photobiol.91, 1(1995) |
| | ClNO | .001 | Martin+Gareis, Z.Elektrochem.60, 959(1956) |
| * | ClNO | .002 | Ballash+Amstrong, Spectrochim.Acta30A, 941(1974) |
| | ClNO | .003 | Illies+Takacs, J.Photochem.6, 35(1976) |
| * | ClNO | .004 | Tyndall etal, J.Photochem.36, 133(1987) |
| | ClNO2 | .001 | Martin+Gareis, Z.Elektrochem.60, 959(1956) |
| | ClNO2 | .002 | Illies+Takacs, J.Photochem.6, 35(1976) |
| | ClNO2 | .003 | Nelson+Johnston, J.Phys.Chem.85, 3891(1981) |
| * | ClNO2 | .004 | Ganske etal, J.Geophys.Res.97, 7651(1992) |
| * | ClONO | .001 | Molina+Molina, Geophys.Res.Lett.4, 83(1977) |

| | | | |
|---|---|---|---|
| | ClNO3 | .001 | Rowland etal, J.Phys.Chem.80, 2711(1976) |
| | ClNO3 | .002 | Knauth etal, priv. comm., 1978 |
| * | ClNO3 | .009 | Molina+Molina, J.Photochem.11, 139(1979) |
| | ClNO3 | .012 | Burkholder etal, Geophys.Res.Lett.21, 585(1994) |

**Bromine Species:**

| | | | |
|---|---|---|---|
| | Br2 | .001 | Seery+Britton, J.Phys.Chem.68, 2263(1964) |
| | Br2 | .002 | McMillan in Calvert+Pitts "Photochemistry" (1966) |
| * | Br2 | .003 | Passchier etal, J.Phys.Chem.71, 937(1967) |
| | Br2 | .004 | Schneider+vonHelden, MPI Mainz, 1991 |
| | Br2 | .005 | Schneider+vonHelden, MPI Mainz, 1991 |
| | Br2 | .006 | Hubinger+Nee, J.Photochem.Photobiol.86, 1(1995 |
| | BrO | .001 | Cox etal, J.Photochem.19, 189(1982) |
| * | BrO | .002 | Wahner etal, Chem.Phys.Lett.152, 507(1988) |
| | Br2O | .001 | Orlando+Burkholder, J.Phys.Chem.99, 1143(1994) |
| | Br2O | .002 | Deters etal, subm. Ann.Geophysicae (1995) |
| | HOBr | .001 | Orlando+Burkholder, J.Phys.Chem.99, 1134(1994) |
| | HOBr | .002 | Benter etal, Ber.Bunsenges.99, 1144(1995) |
| | HOBr | .003 | Deters etal, subm. Ann.Geophysicae (1995) |
| * | BrNO3 | .001 | Spencer+Rowland, J.Phys.Chem.82, 7(1978) |
| * | BrCl | .001 | Maric etal, J.Photochem.Photobiol.83, 179(1994) |
| | BrCl | .002 | Maric etal, J.Photochem.Photobiol.83, 179(1994) |
| | BrCl | .003 | Hubinger+Nee, J.Photochem.Photobiol.86, 1(1995) |

**Sulfur Species:**

| | | | |
|---|---|---|---|
| | COS | .001 | Matsunaga+Watanabe, J.Chem.Phys.46, 4457(1967) |
| | COS | .002 | Breckenridge+Taube, J.Chem.Phys.52, 1713(1970) |
| | COS | .003 | Ferro+Reuben, TransFaradaySoc.67, 2847(1971) |
| | COS | .004 | NASA Panel Data Evaluation 1979 |
| | COS | .007 | Leroy etal, Ann.Geophys.Res.37, 297(1981) |
| * | COS | .008 | Molina etal, Geophys.Res.Lett.8, 1008(1981) |
| | COS | .010 | Rudolph+Inn, J.Geophys.Res.86, 9891(1981) |
| | COS | .011 | Wu+Judge, J.Chem.Phys.76, 2871(1982) |
| | CS2 | .001 | Leroy etal, Ann.Geophys.Res.37, 297(1981) |
| | CS2 | .002 | Wine etal, Geophys.Res.Lett.8, 543(1981) |

| | | | |
|---|---|---|---|
| | CS2 | .003 | Wu+Judge, Geophys.Res.Lett.8, 769(1981) |
| | CS2 | .004 | Dove etal, J.Chem.Phys.81, 1209(1984) |
| * | CS2 | .005 | Schneider+Moortgat, MPI Mainz, 1990 |
| | CS2 | .006 | Xu+Joens, Geophys.Res.Lett.20, 1035(1993) |
| | CS2 | .007 | Chen+Wu, Geophys.Res.Lett.22, 2131(1995) |
| | SO2 | .001 | Golomb etal, J.Chem.Phys.36, 958(1962) |
| | SO2 | .002 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| * | SO2 | .003 | Warneck etal, J.Chem.Phys.40, 1132(1964) |
| * | SO2 | .004 | Sidebottom etal, Environm.Sci.Technol.6, 72(1972) |
| | SO2 | .005 | Thompson, J.Appl.Phys.46, 3040(1975) |
| | SO2 | .006 | Kelly etal, J.Photochem.6, 157(1976) |
| | SO2 | .007 | Woods etal, Opt.Commun.33, 281(1980) |
| | SO2 | .008 | Brassington, Applied Optics20, 3774(1981) |
| | SO2 | .009 | Wu+Judge, J.Chem.Phys.74, 3804(1981) |
| * | SO2 | .010 | Freeman etal, Planet.SpaceSci.32, 1125(1984) |
| | SO2 | .011 | Weibring, Diploma-Thesis, Uni Göttingen ,Germany |
| | SO2 | .012 | McGee+Burris, J.Quant.Spec.Rad.Transf.32, 165(1987) |
| * | SO2 | .014 | Martinez+Joens, Geophys.Res.Lett.19, 277(1992) |
| | SO2 | .015 | Vandaele etal., J.Geophys.Res.99, 25599(1994) |

**Other Species:**

| | | | |
|---|---|---|---|
| | CO2 | .001 | Thompson etal, J.Geophys.Res.68, 6431(1963) |
| | CO2 | .002 | Ogawa, J.Chem.Phys.54, 2550(1971) |
| * | CO2 | .003 | Shemansky, J.Chem.Phys.56, 1582(1972) |
| | CO2 | .004 | Yoshino etal, subm. J.Geophys.Res., Nov.1994 |
| * | NaCl | .001 | Silver etal, J.Chem.Phys.84, 4378(1986) |

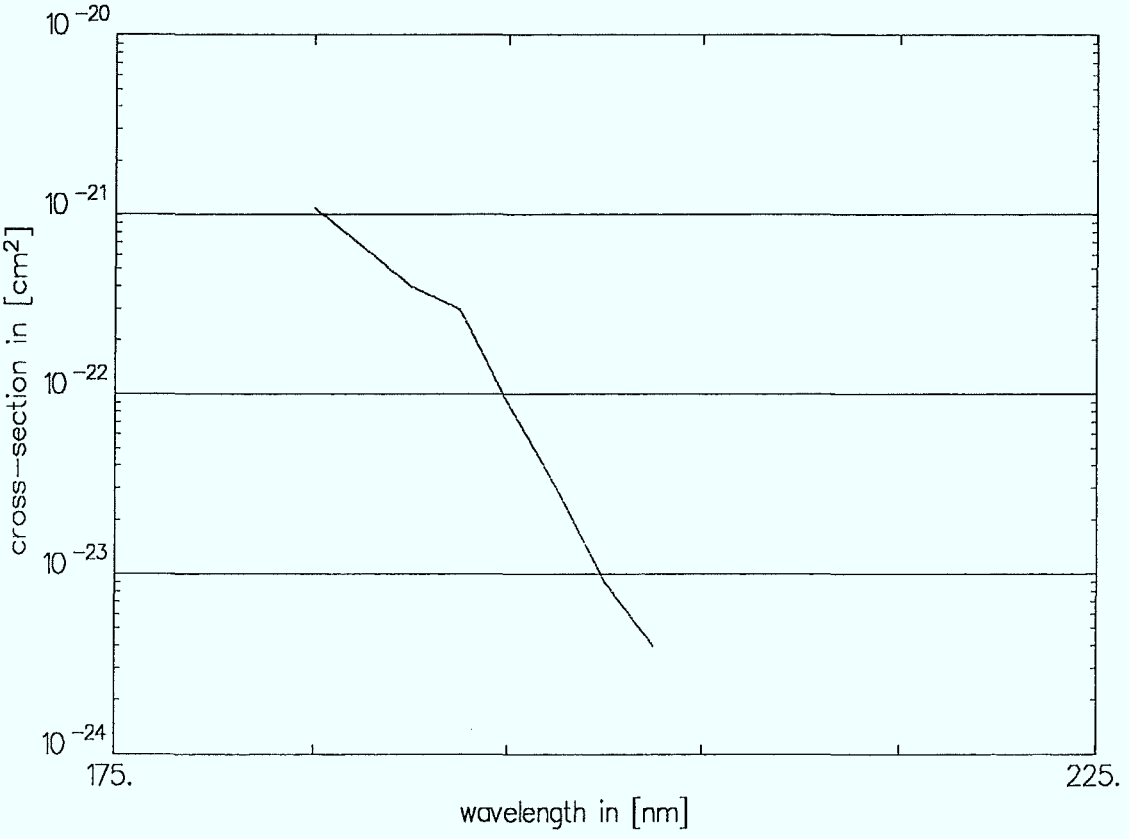
Substance: $O_2$

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



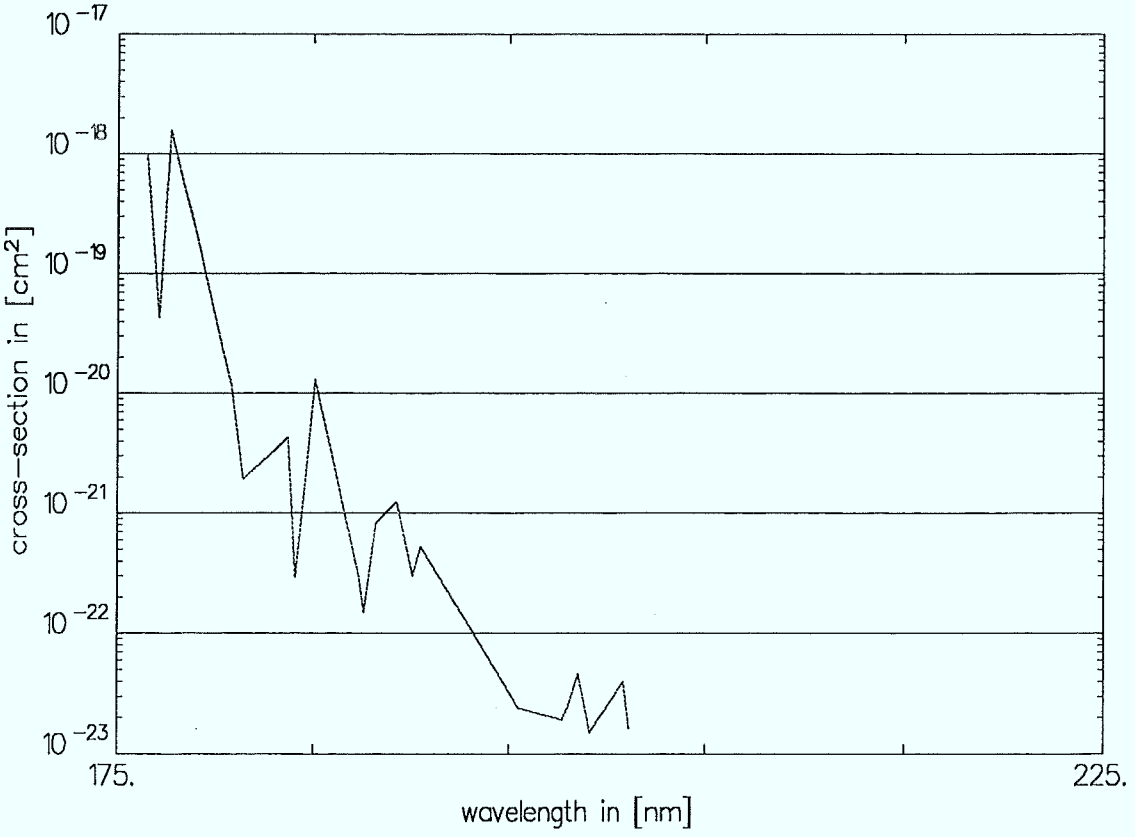
Substance: $O_2$

Reference:
Ackerman, M., F. Biaumé, and G. Kockarts, Absorption Cross Sections of the Schumann-Runge Bands of Molecular Oxygen, Planet. Space Sci., **18** (1970), 1639-1651

Data: table Resolution: 0.3 - 5.0 nm

Temperature: 300. K

Temperature dependence: no



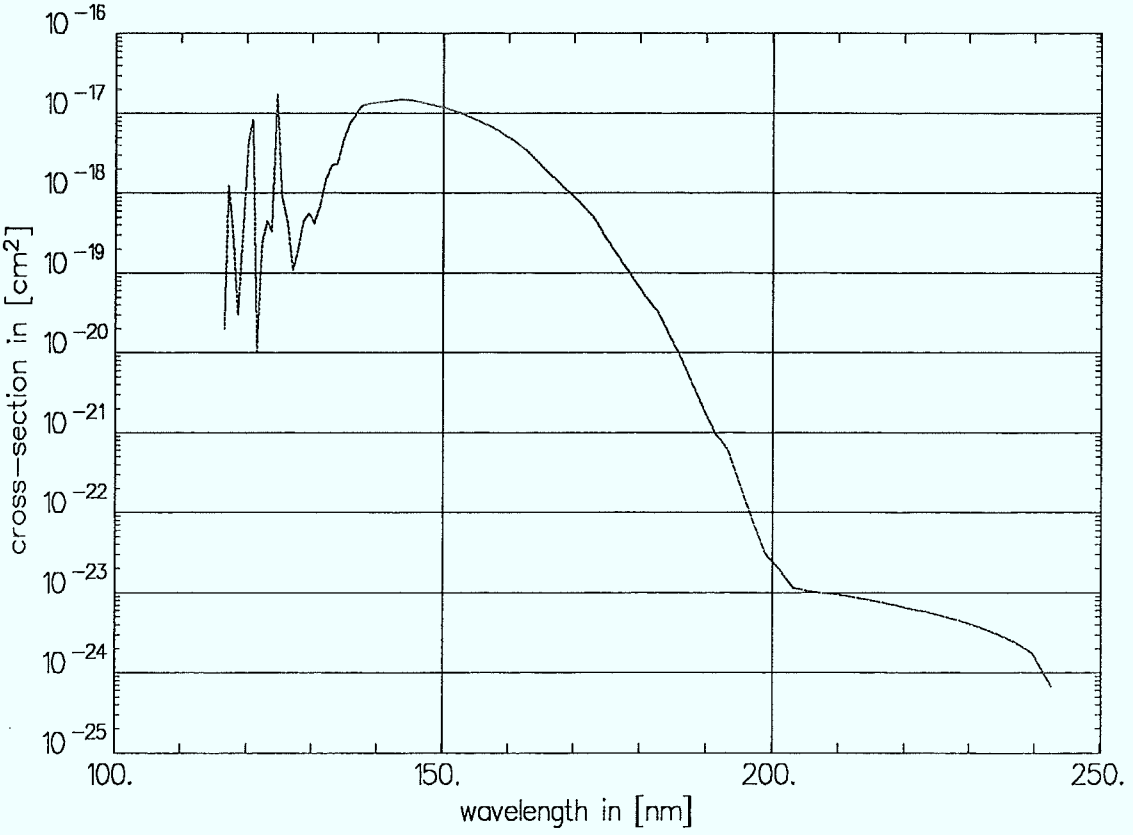
Substance: $O_2$

Reference:
Ackerman, M., UV-Solar Radiation Related to Mesospheric Prozesses, in G. Fiocco, *Mesospheric Models and Related Experiments*, D. Reidel Publishing Company, Dordrecht, 1971, 149-159

Data: table Resolution: 0.6 - 2.9 nm

Temperature: 298. K

Temperature dependence: no



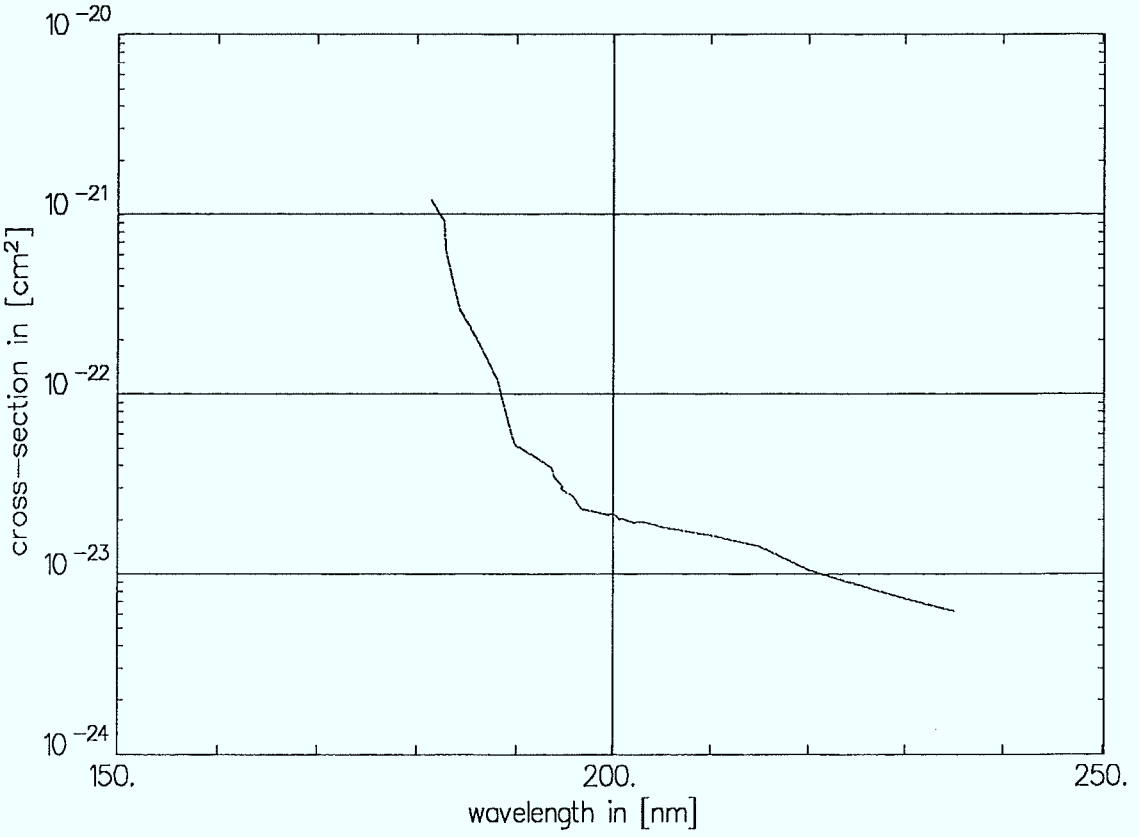
Substance: $O_2$

Reference:
Ogawa, M., Absorption Cross Sections of $O_2$ and $CO_2$ Continua in the Schumann and Far-uv Regions, J. Chem. Phys. **54** (1971), 2550-2556

Data: table Resolution: 1.5 - 6.5 nm

Temperature: 298. K

Temperature dependence: no



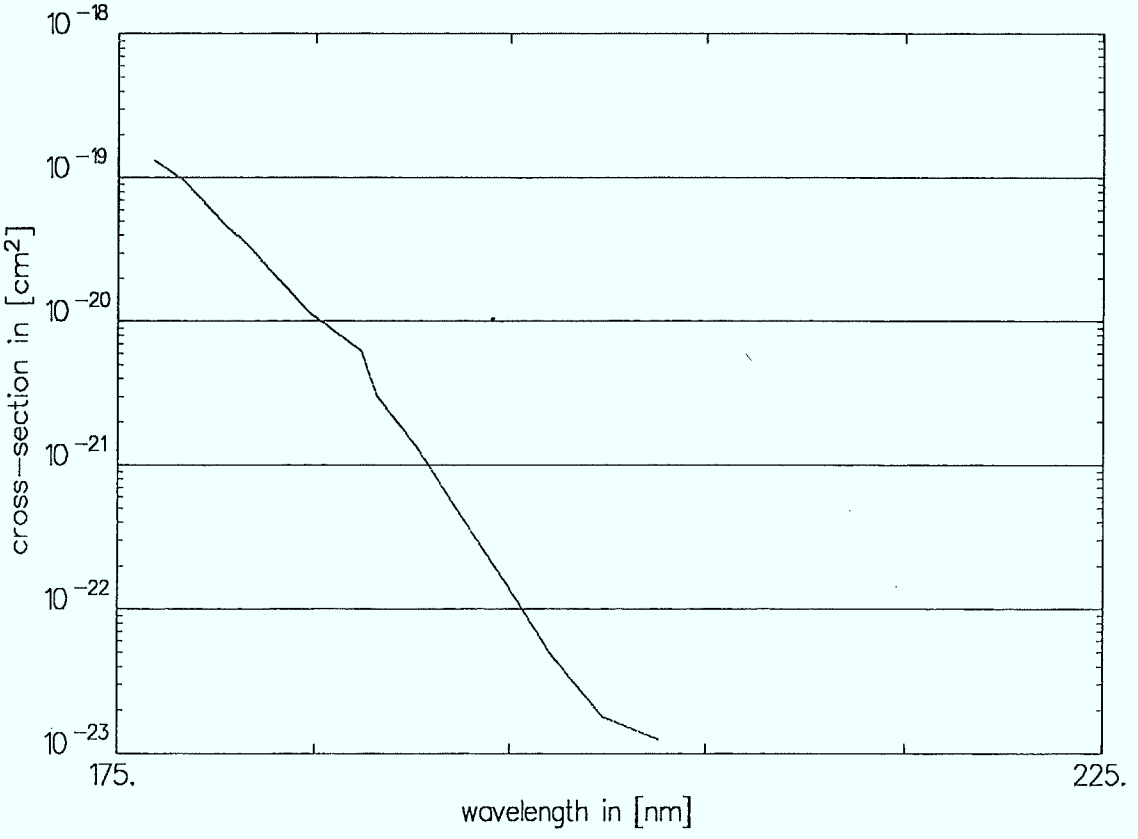
Substance: $O_2$

Reference:
Kockarts, G., Absorption and Photodissociation in the Schumann-Runge Bands of Molecular Oxygen in the Terrestrial Atmosphere, Planet. Space Sci., **24** (1976), 589-604

Data: diagram

Temperature: 300. K

Temperature dependence: no



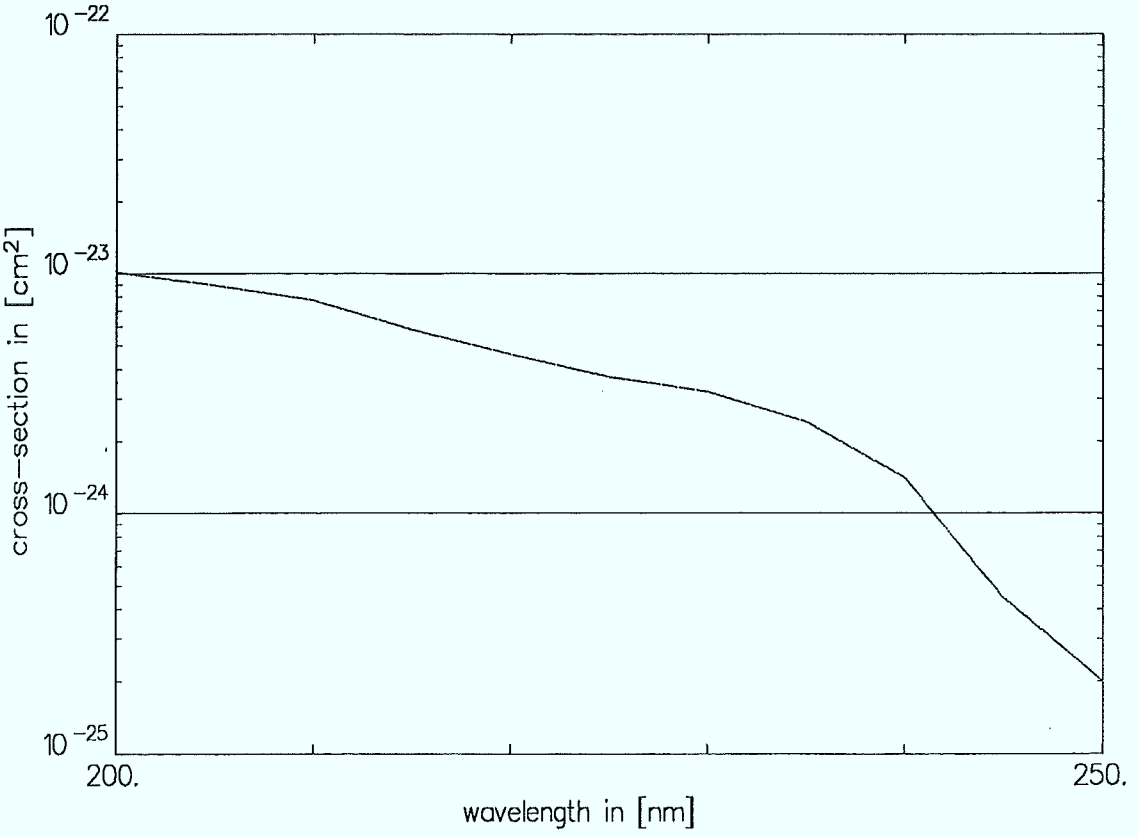
Substance: $O_2$

Reference:
Shardanand, and A.D. Prasad Rao, Collision-Induced Absorption of $O_2$ in the Herzberg Continuum, J. Quant. Spectrosc. Radiat. Transfer, **17** (1977), 433-439

Data: table Resolution: 5.0 nm

Temperature: 300. K

Temperature dependence: no



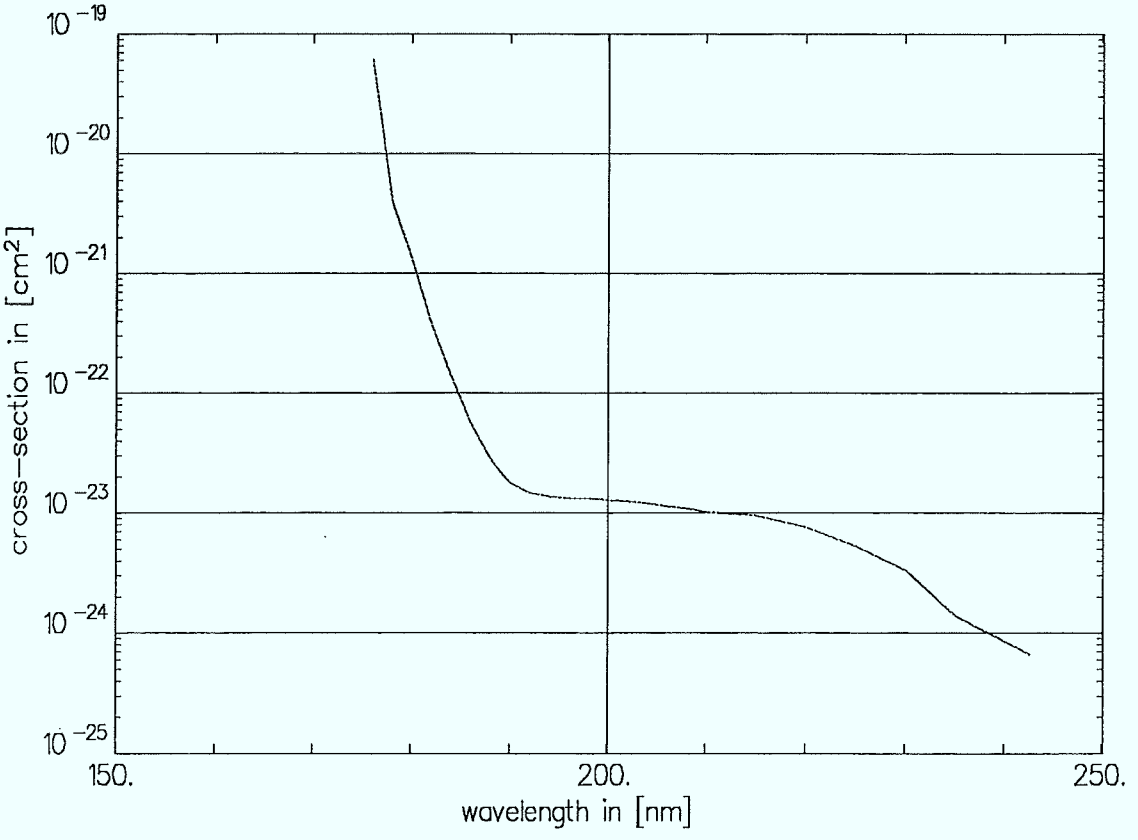
Substance: $O_2$

Reference:
Frederick, J.E., and J.E. Mentall, Solar Irradiance in the Stratosphere: Implications for the Herzberg Continuum Absorption of $O_2$, Geophys. Res. Lett., **9** (1982), 461-464

Data: formula Resolution: 2.0 - 7.5 nm

Temperature: 300. K

Temperature dependence: 300. / 250. / 200. K



Substance: $O_2$

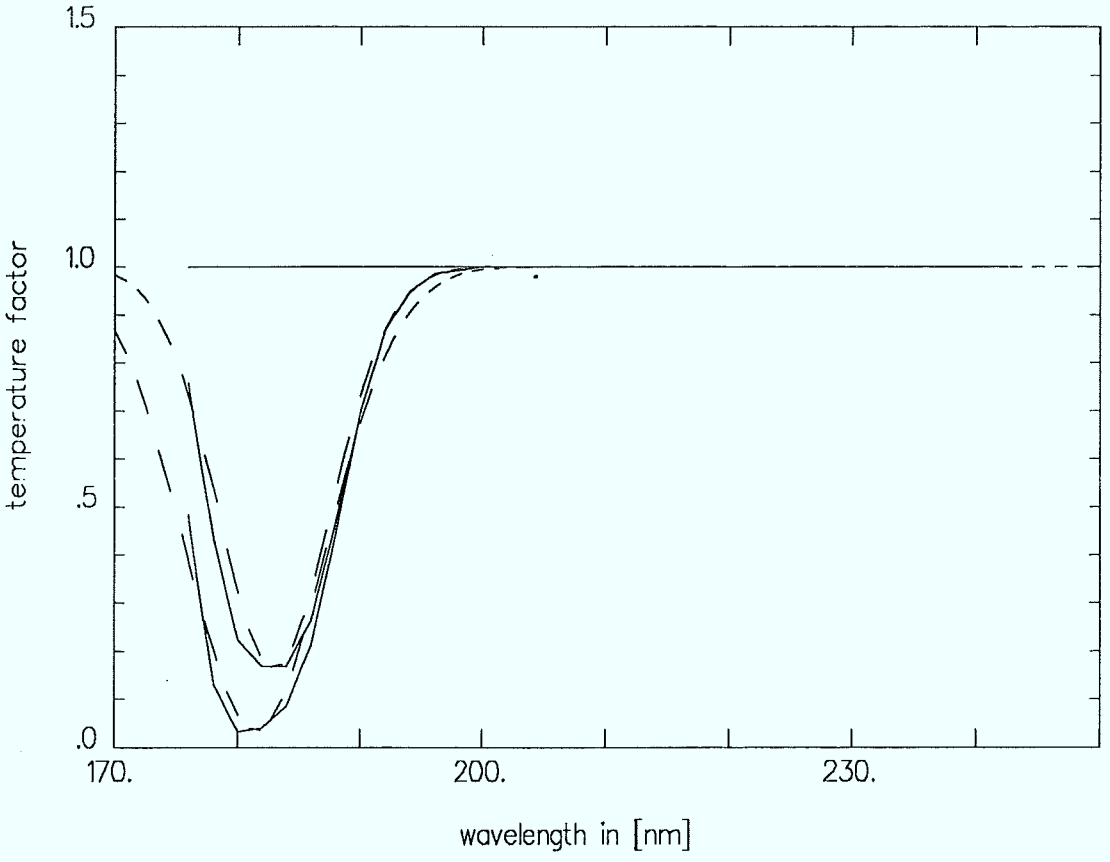
Reference:
Frederick, J.E., and J.E. Mentall, Solar Irradiance in the Stratosphere: Implications for the Herzberg Continuum Absorption of $O_2$, Geophys. Res. Lett., **9** (1982), 461-464

Temperatures: 300. / 250. / 200. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 2.375E-2 | b = | -1.41E-4 | c = | 1.7E-2 |
| d = | -1.6E-4 | e = | 175.5 | f = | 3.E-2 |



Substance: $O_2$

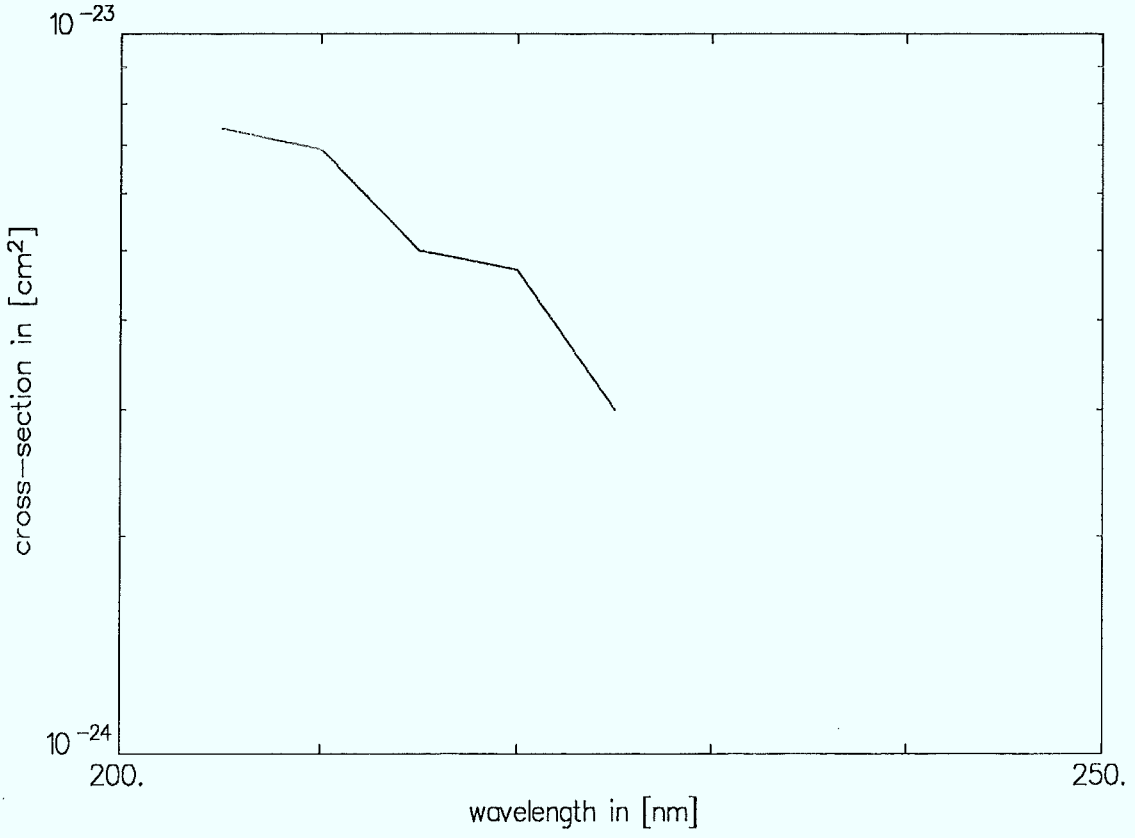
Reference:
Johnston, H.S., M. Paige, and F. Yao, Oxygen Absorption Cross Sections in the Herzberg Continuum and Between 206 and 327 K, J. Geophys. Res., **89** (1984), 11661-11665

Data: table Resolution: 5.0 nm

Temperature: 297. K

Temperature dependence: no

Comment: No temperature effect on the $O_2$ cross sections was observed in the Herzberg continuum.



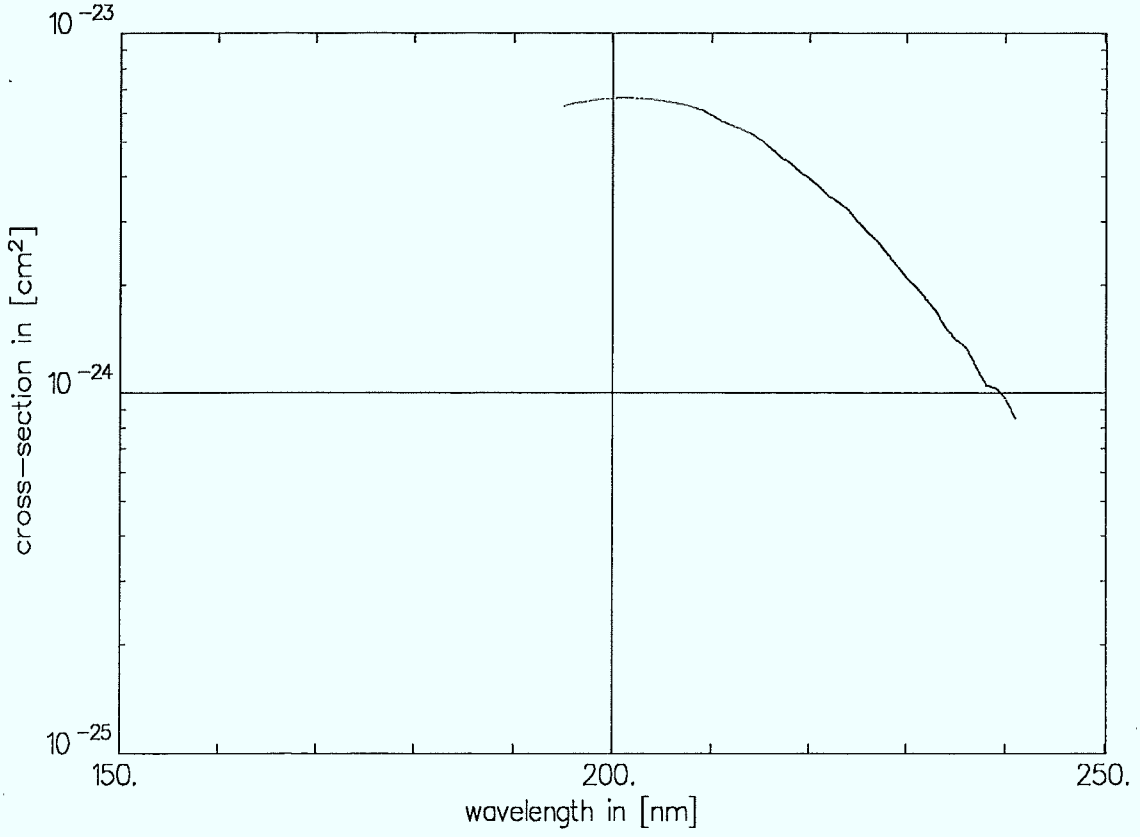
Substance: $O_2$

Reference:
Cheung, A.S.-C., K. Yoshino, W.H. Parkinson, S.L. Guberman, and D.E. Freeman, Absorption Cross Section Measurements of Oxygen in the Wavelength Region 195-241 nm of the Herzberg Continuum, Planet. Space Sci., **34** (1986), 1007-1021

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no



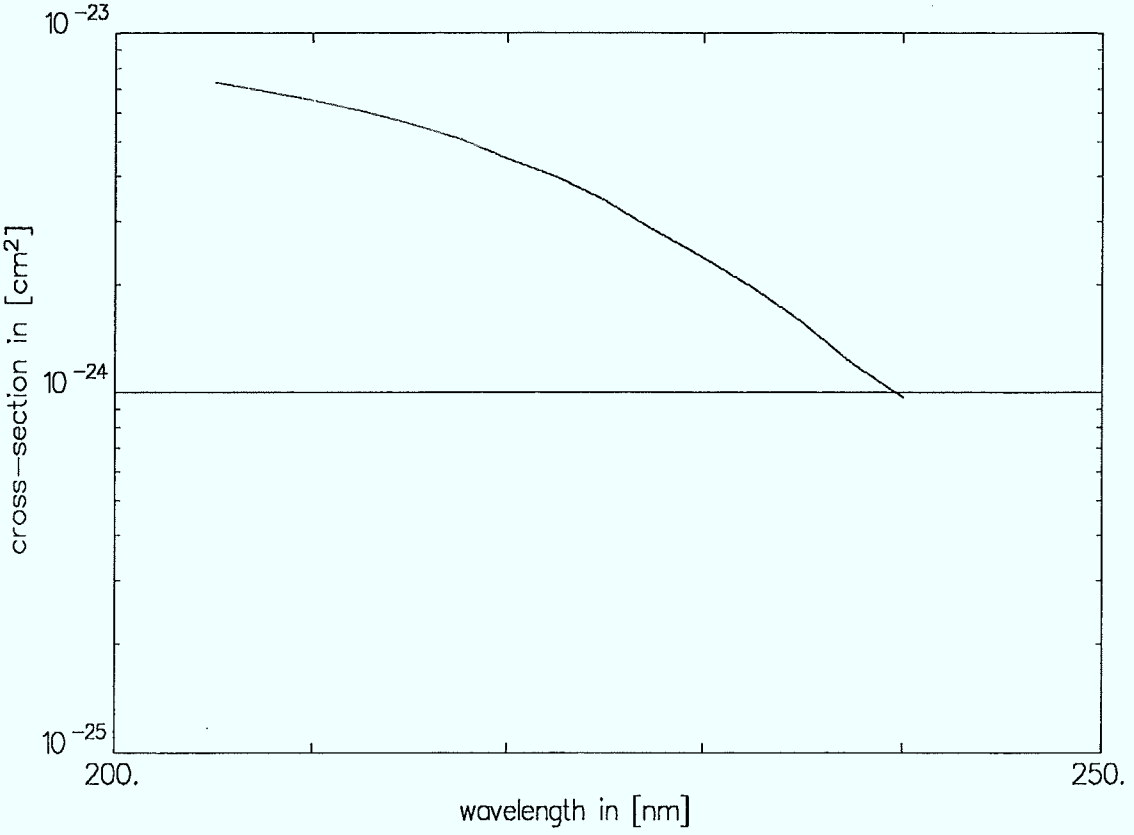
Substance: $O_2$

Reference:
Jenouvrier, A., B. Coquart, and M.F. Merienne-Lafore, New Measurements of the Absorption Cross-Sections in the Herzberg Continuum of Molecular Oxygen in the Region between 205 and 240 nm, Planet. Space Sci., **34** (1986), 253-254

Data: table Resolution: 2.5 nm

Temperature: 298. K

Temperature dependence: no



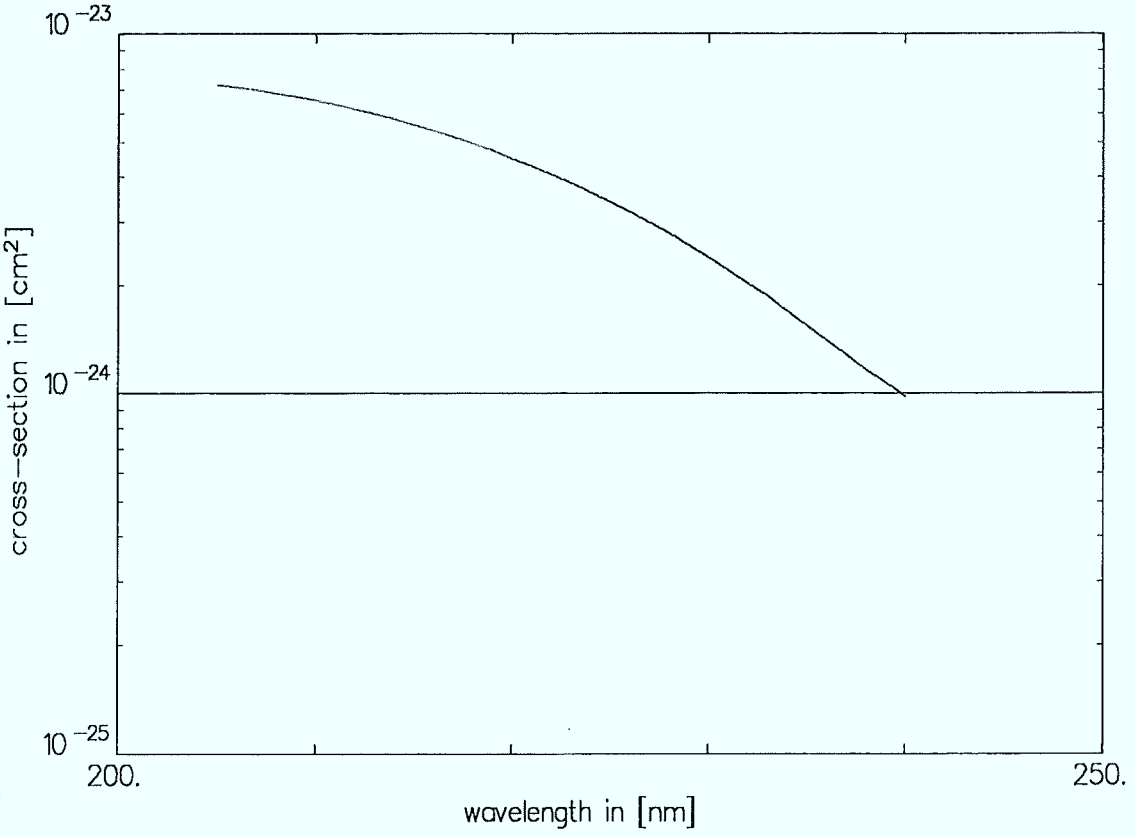
Substance: $O_2$

Reference:
Jenouvrier, A., B. Coquart, and M.F. Merienne, Long Pathlength Measurements of Oxygen Absorption Cross Sections in the Wavelength Region 205-240 nm, J. Quant. Spectrosc. Radiat. Transfer, **36** (1986), 349-354

Data: table Resolution: 1.0 nm

Temperature: 292. K

Temperature dependence: no



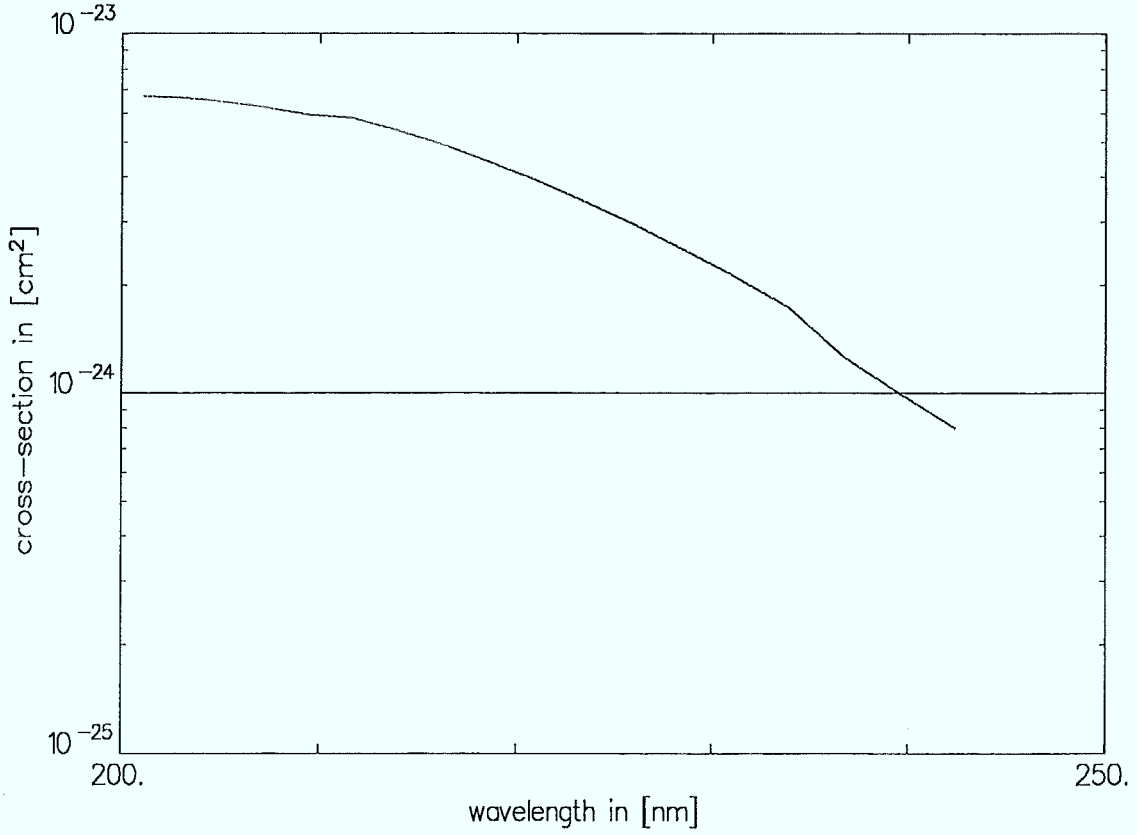
Substance: $O_2$

Reference:
Nicolet, M., and R. Kennes, Aeronomic Problems of the Molecular Oxygen Photodissociation - I. The $O_2$ Herzberg Continuum, Planet. Space Sci., **34** (1986), 1043-1059

Data: table Resolution: 2.0 - 2.9 nm

Temperature: 298. K

Temperature dependence: no



Substance: $O_2$

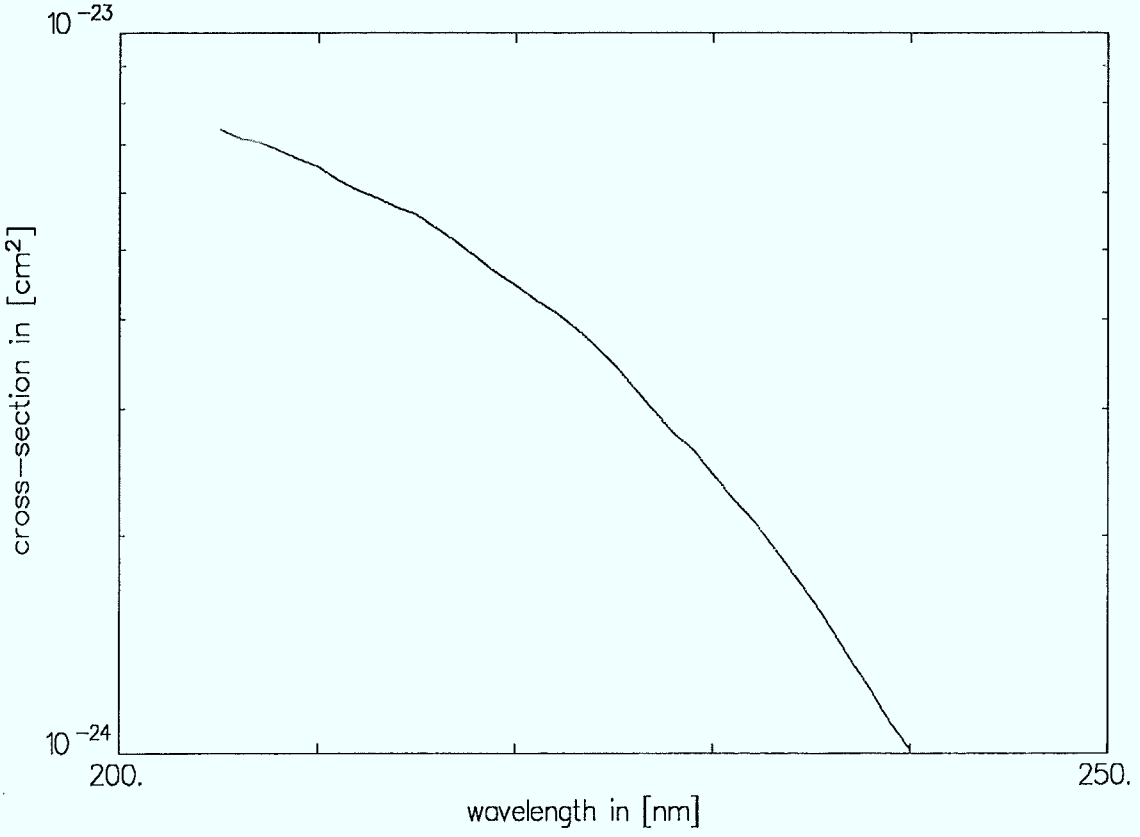
Reference:
Yoshino, K., A.S.-C. Cheung, J.R. Esmond, W.H. Parkinson, D.E. Freeman, S.L. Guberman, A. Jenouvrier, B. Coquart, and M.F. Merienne, Improved Absorption Cross-Sections of Oxygen in the Wavelength Region 205-240 nm of the Herzberg Continuum, Planet. Space Sci., **36** (1988), 1469-1475

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: Herzberg Continuum photoabsorption cross-section values from Cheung et al (1986) and Jenouvrier et al (1986) have been re-analyzed and combined together



Substance: $O_2$

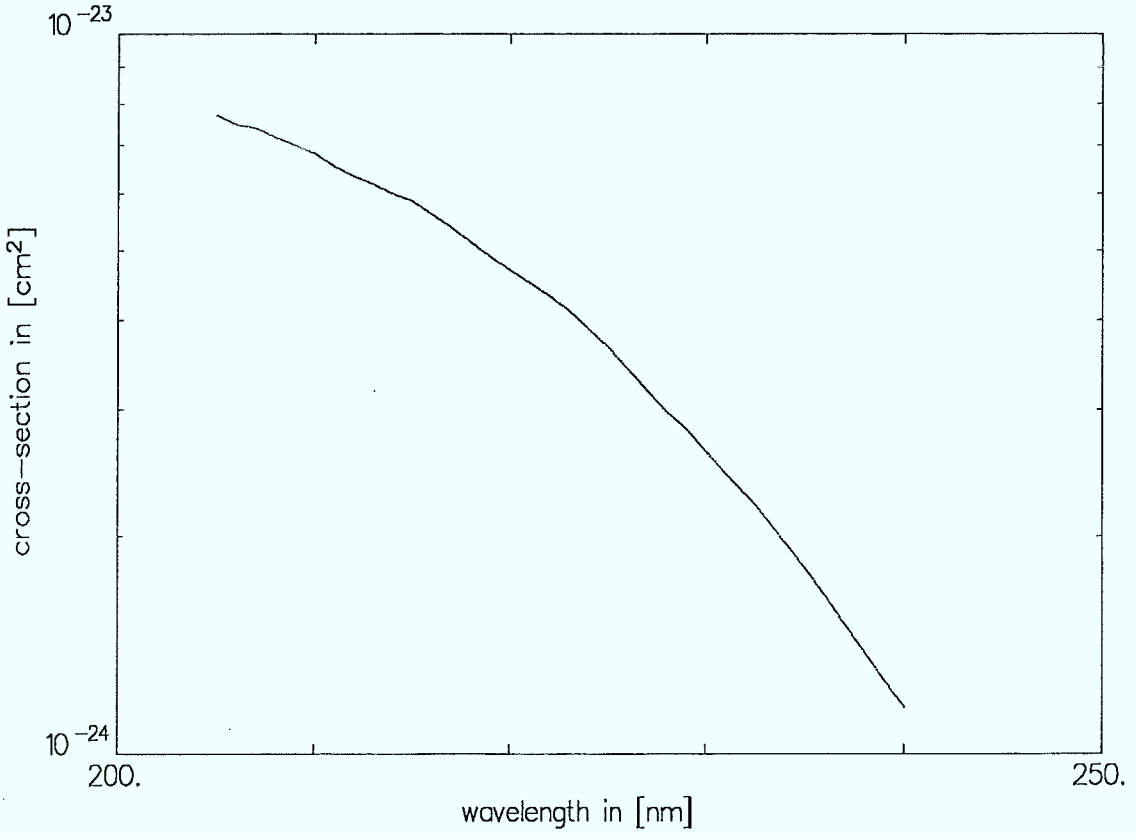
Reference:
Yoshino, K., A.S.-C. Cheung, J.R. Esmond, W.H. Parkinson, D.E. Freeman, S.L. Guberman, A. Jenouvrier, B. Coquart, and M.F. Merienne, Improved Absorption Cross-Sections of Oxygen in the Wavelength Region 205-240 nm of the Herzberg Continuum, Planet. Space Sci., **36** (1988), 1469-1475

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: Laboratory values of the cross-section of $O_2$ from Cheung et al (1986) and Jenouvrier et al (1986) have been re-analyzed and combined together



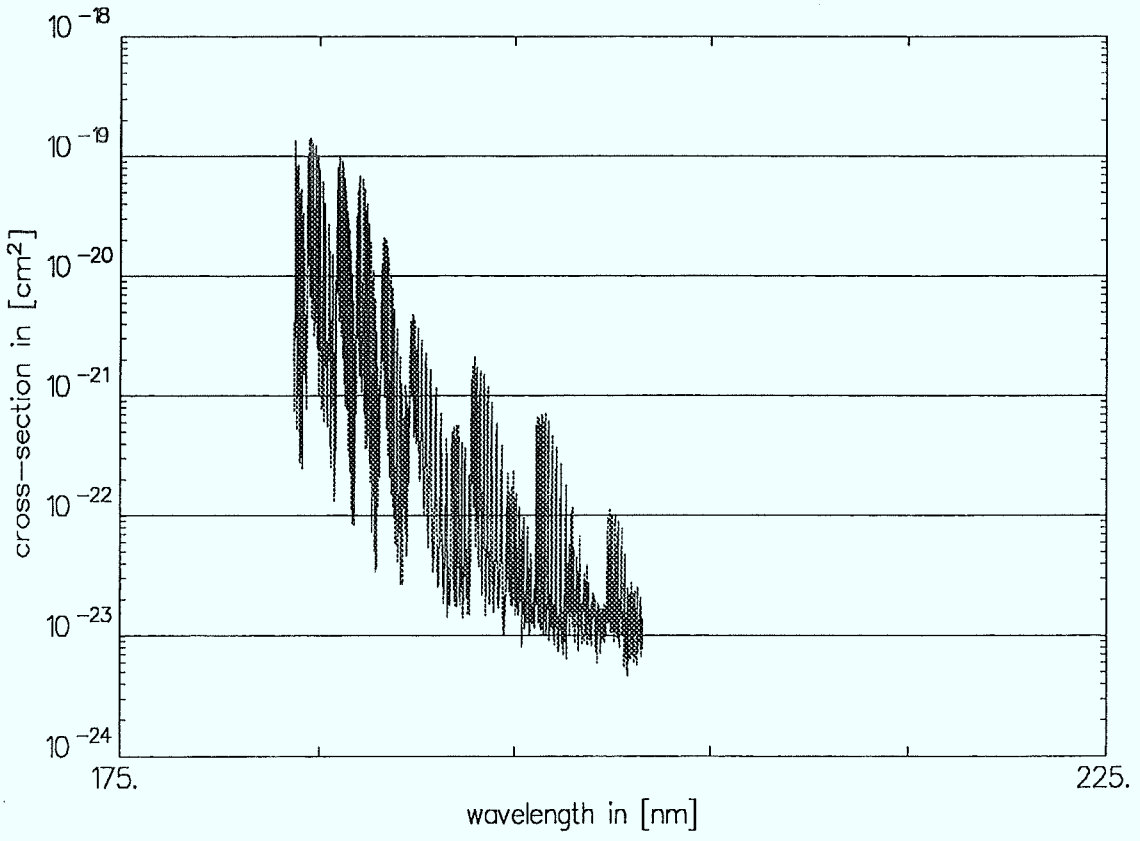
Substance: $O_2$

Reference:
K. Yoshino, priv. comm., Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts, USA, 1991

Data: disk Resolution: 0.01 nm

Temperature: 298. K

Temperature dependence: no



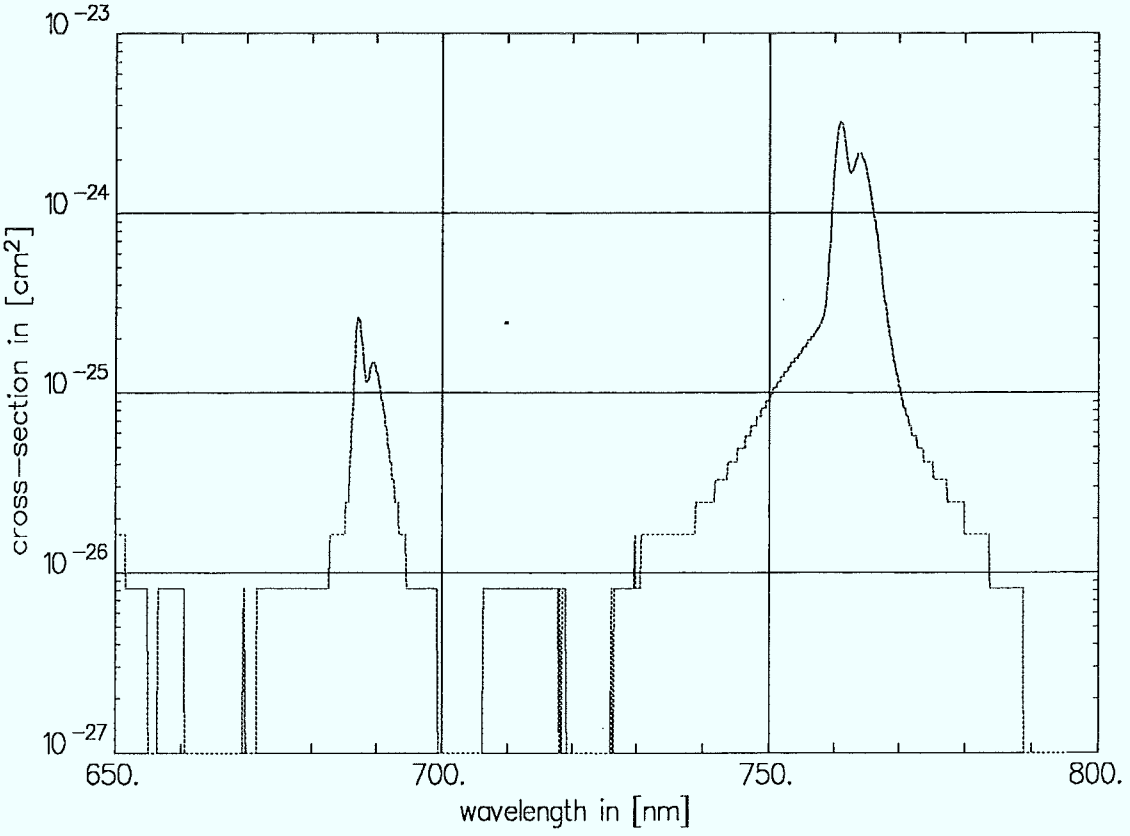
Substance: $O_2$

Reference:
Greenblatt et al.,
NOAA, 1990

Data: disk Resolution: 0.1 nm

Temperature: 298. K

Temperature dependence: no



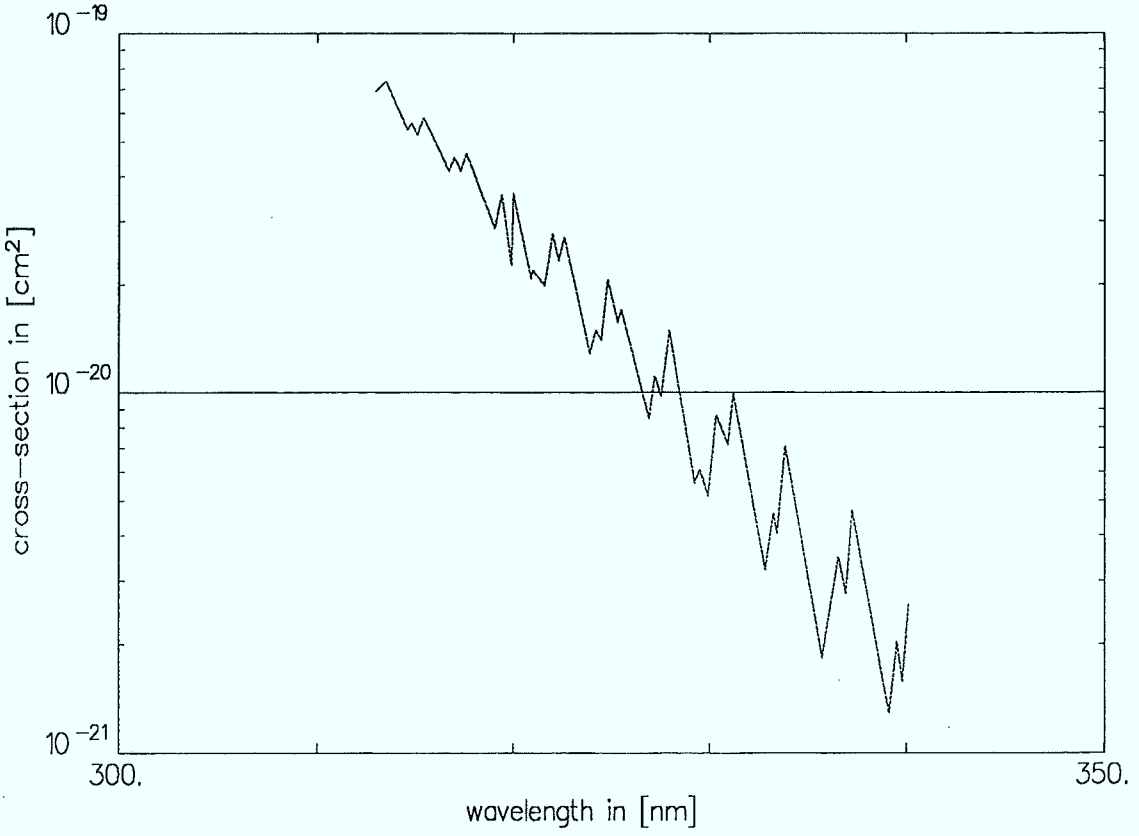
Substance: $O_3$

Reference:
Vigroux, E., Absorption de l'ozone dans le domaine spectral situé au-dessous de 3130 A. Effect de la température, Comptes rendus, **234** (1952), 2439-2440

Data: table Resolution: 0.2 - 1.9 nm

Temperature: 291. K

Temperature dependence: 291. / 243. / 214. / 181. K



Substance: $O_3$

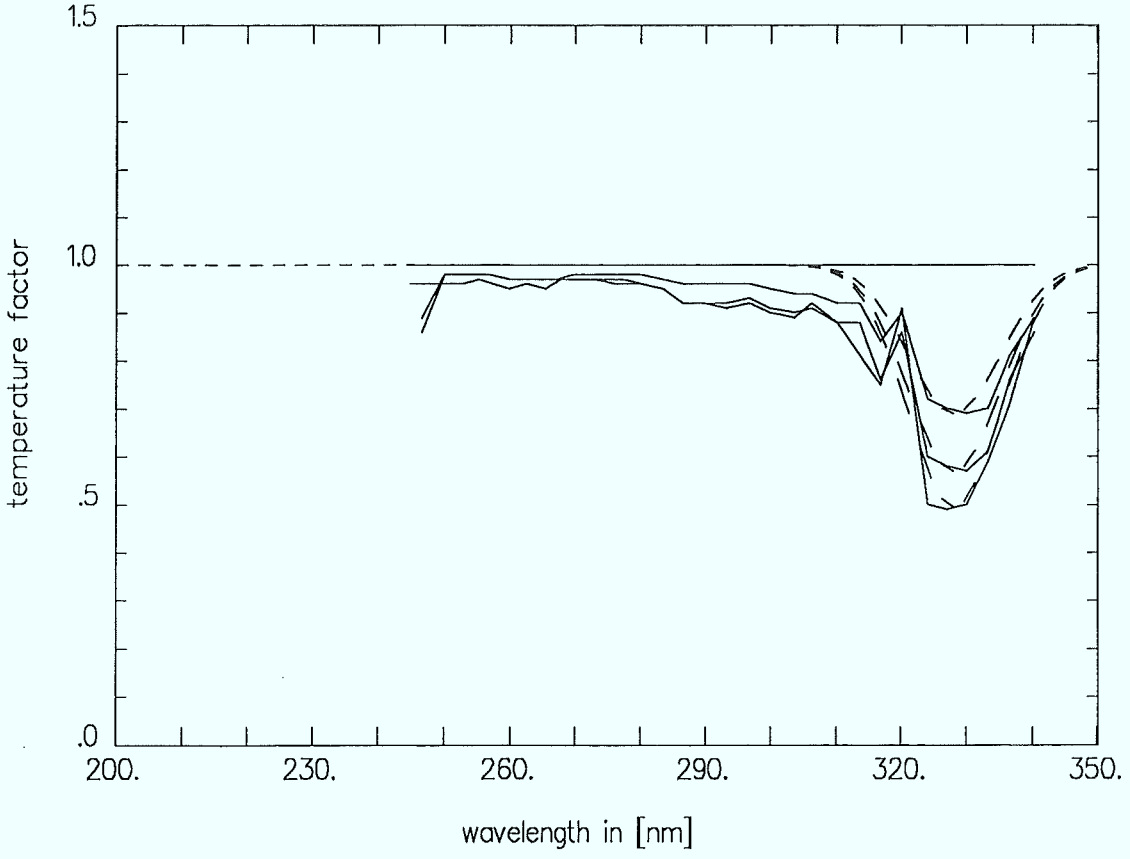
Reference:
Vigroux, E., Absorption de l'ozone dans le domaine spectral situé au-dessous de 3130 A. Effect de la température, Comptes rendus, **234** (1952), 2439-2440

Temperatures: 291. / 243. / 214. / 181. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 7.905E-3 | b = | 3.014E-5 | c = | -1.E-2 |
| d = | 0. | e = | 328. | f = | 0. |



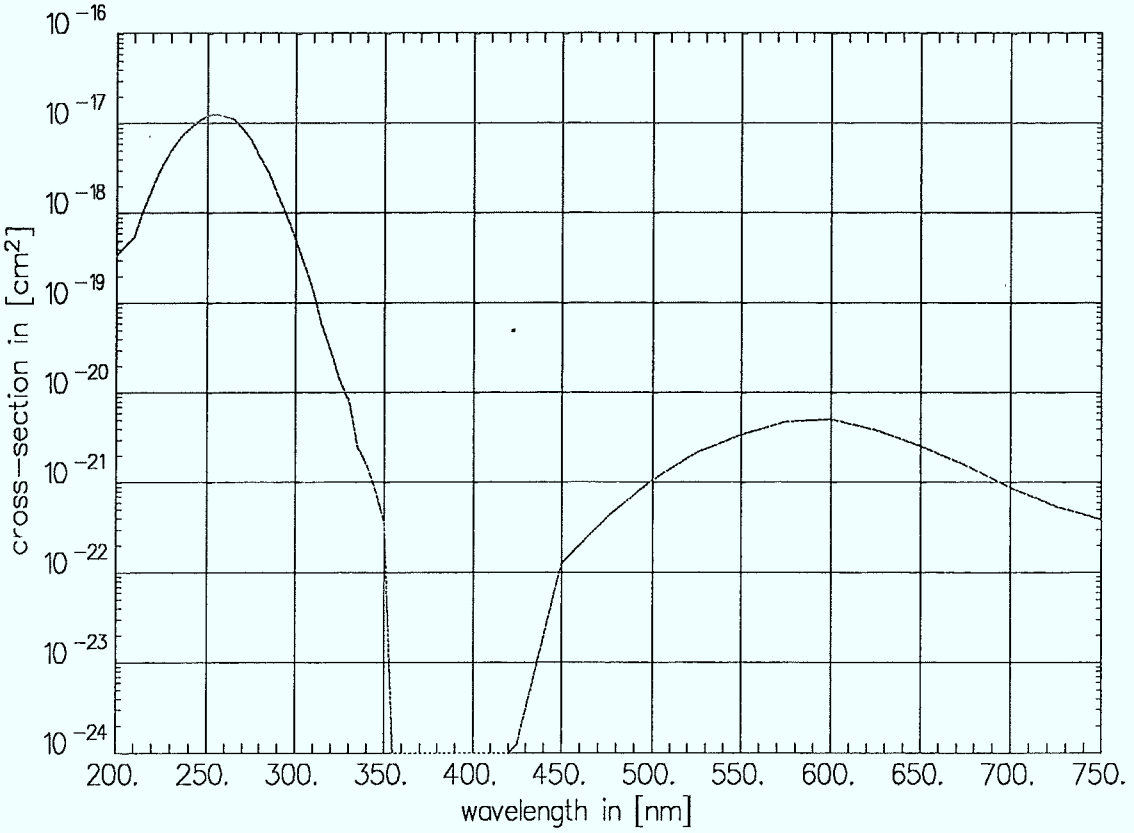
Substance: $O_3$

Reference:
Inn., E.C.Y., and Y. Tanaka, Absorption Coefficient of Ozone in the Ultraviolet and Visible Regions, J. Opt. Soc. Am., **43** (1953), 870-873

Data: diagram

Temperature: 291. K

Temperature dependence: no



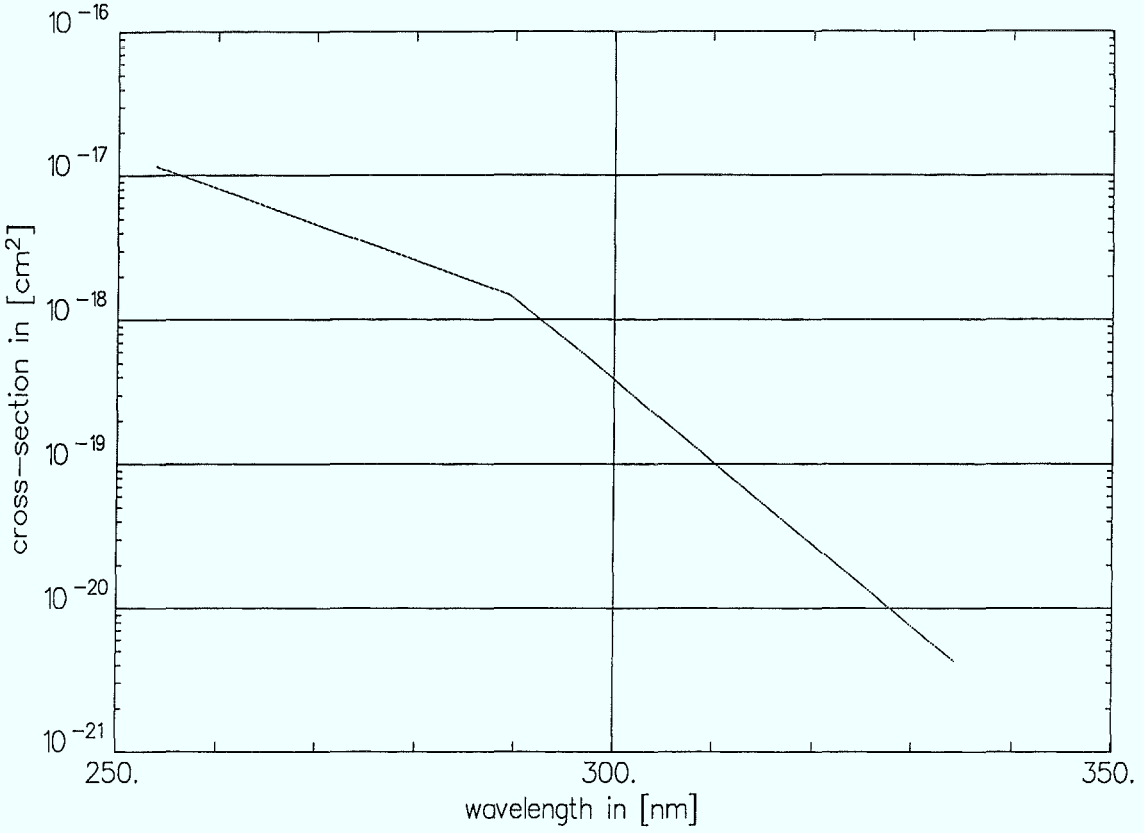
Substance: $O_3$

Reference:
Hearn, A.G., The Absorption of Ozone in the Ultra-violet and Visible Regions of the Spectrum, Proc. Phys. Soc., **78** (1961), 932-940

Data: table

Temperature: 294. K

Temperature dependence: no



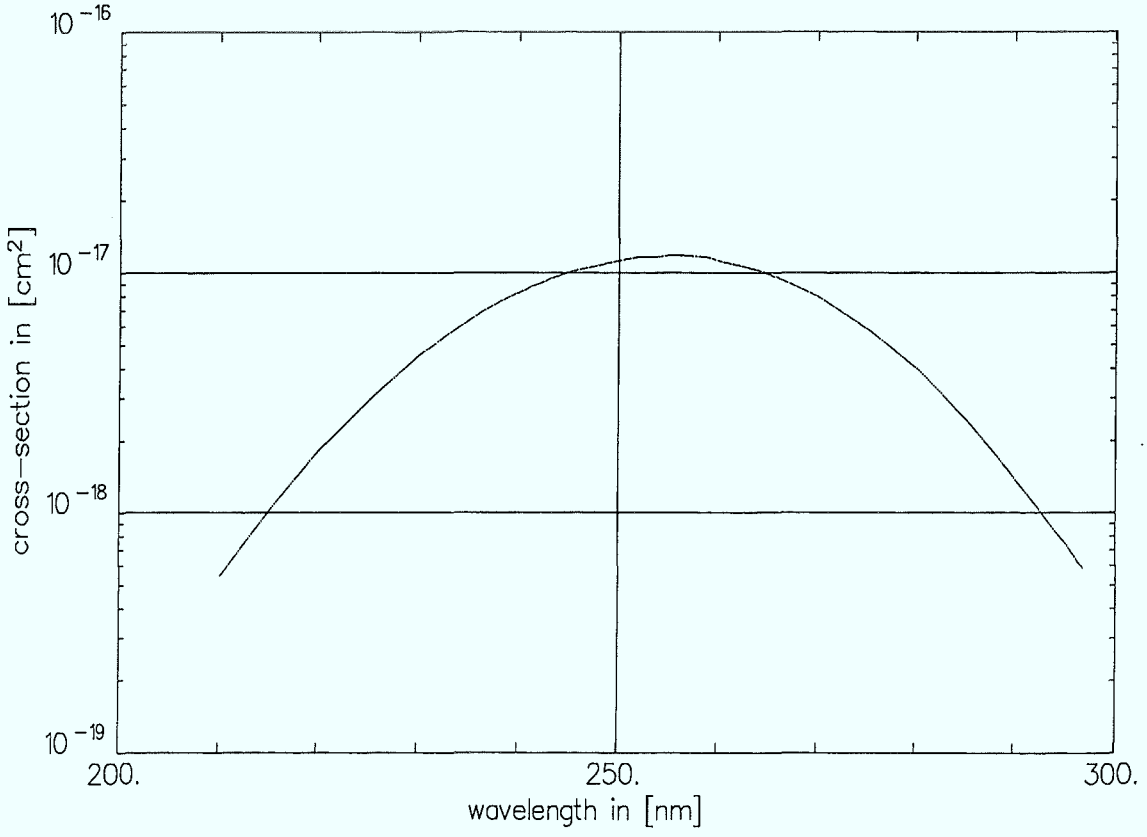
Substance: $O_3$

Reference:
DeMore, W.B., and O. Raper, Hartley Band Extinction Coefficients of Ozone in the Gas Phase and in Liquid Nitrogen, Carbon Monoxide, and Argon, J. Phys. Chem., **68** (1964), 412-414

Data: table Resolution: 0.8 - 5.0 nm

Temperature: 273. K

Temperature dependence: no



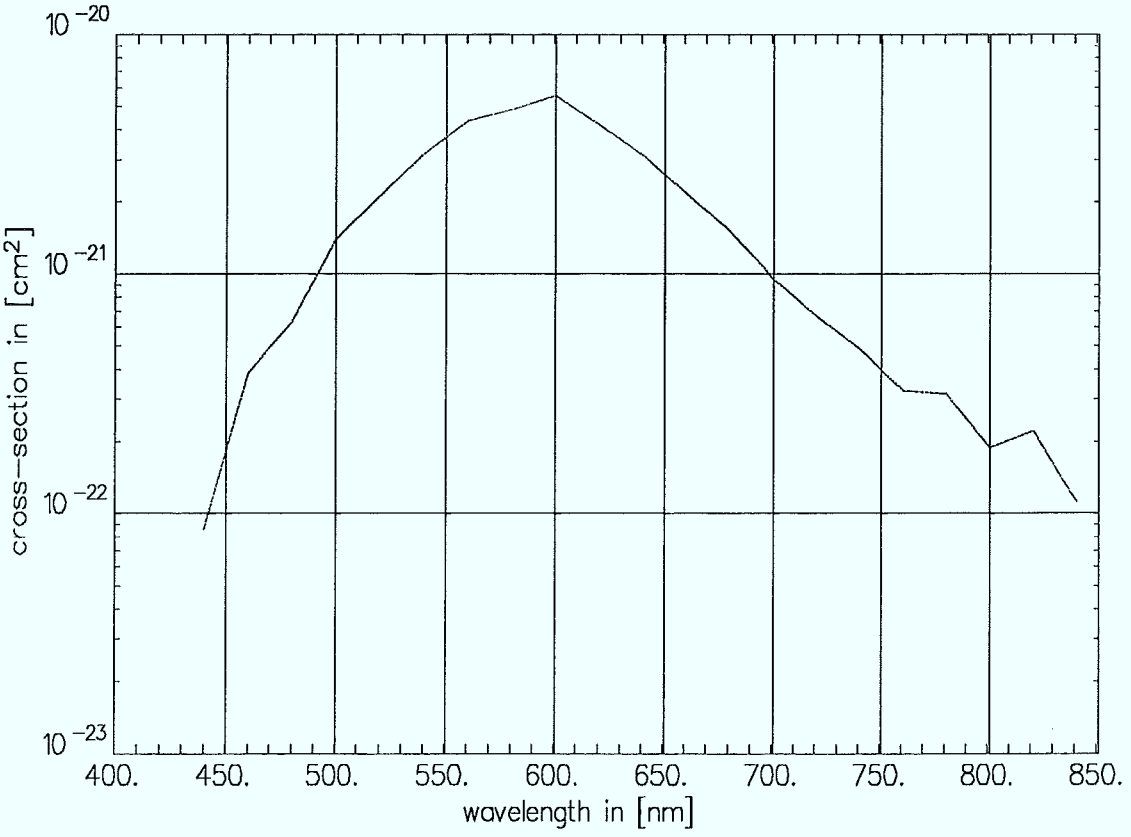
Substance: $O_3$

Reference:
Griggs, M., Absorption Coefficient of Ozone in the Ultraviolet and Visible Regions, J. Chem. Phys., **49** (1968), 857-859

Data: diagram

Temperature: 298. K

Temperature dependence: no



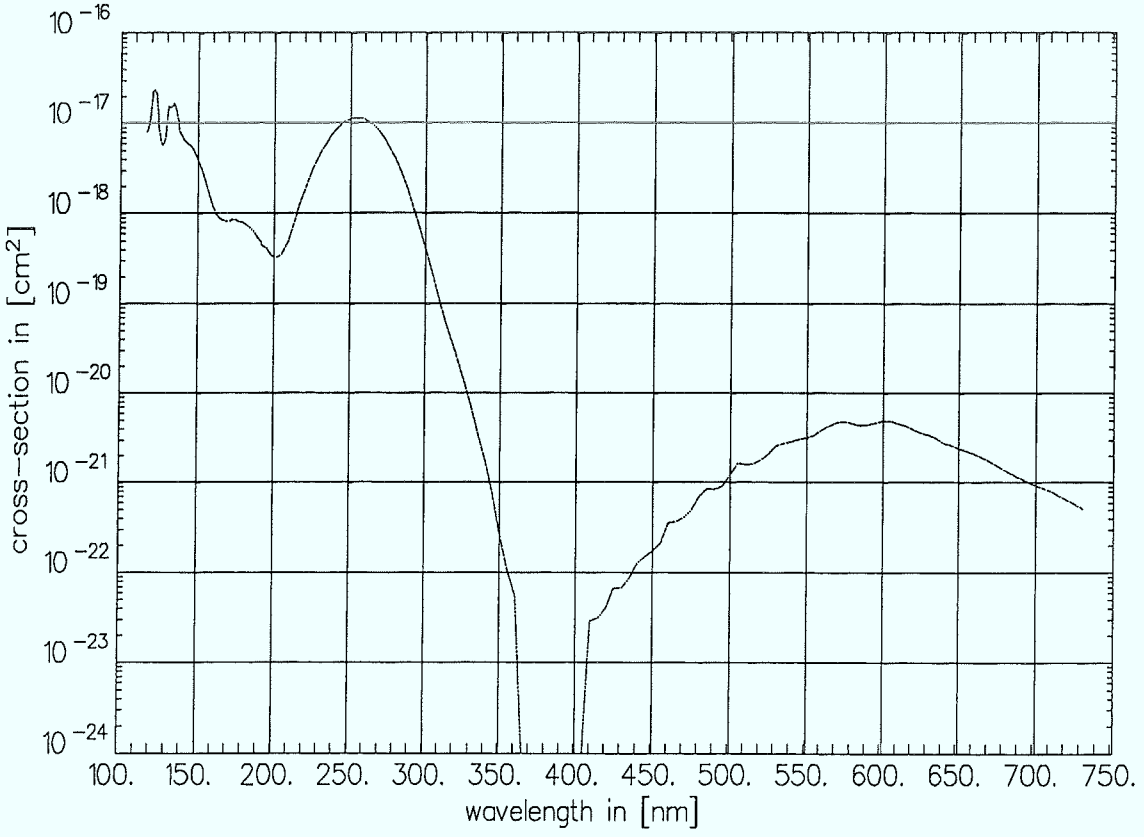
Substance: $O_3$

Reference:
Ackerman, M., UV-Solar Radiation Relatied to Mesospheric Prozesses, in G. Fiocco, *Mesospheric Models and Related Experiments*, D. Reidel Publishing Company, Dordrecht, 1971, 149-159

Data: table Resolution: 0.6 - 2.9 nm

Temperature: 298. K

Temperature dependence: no



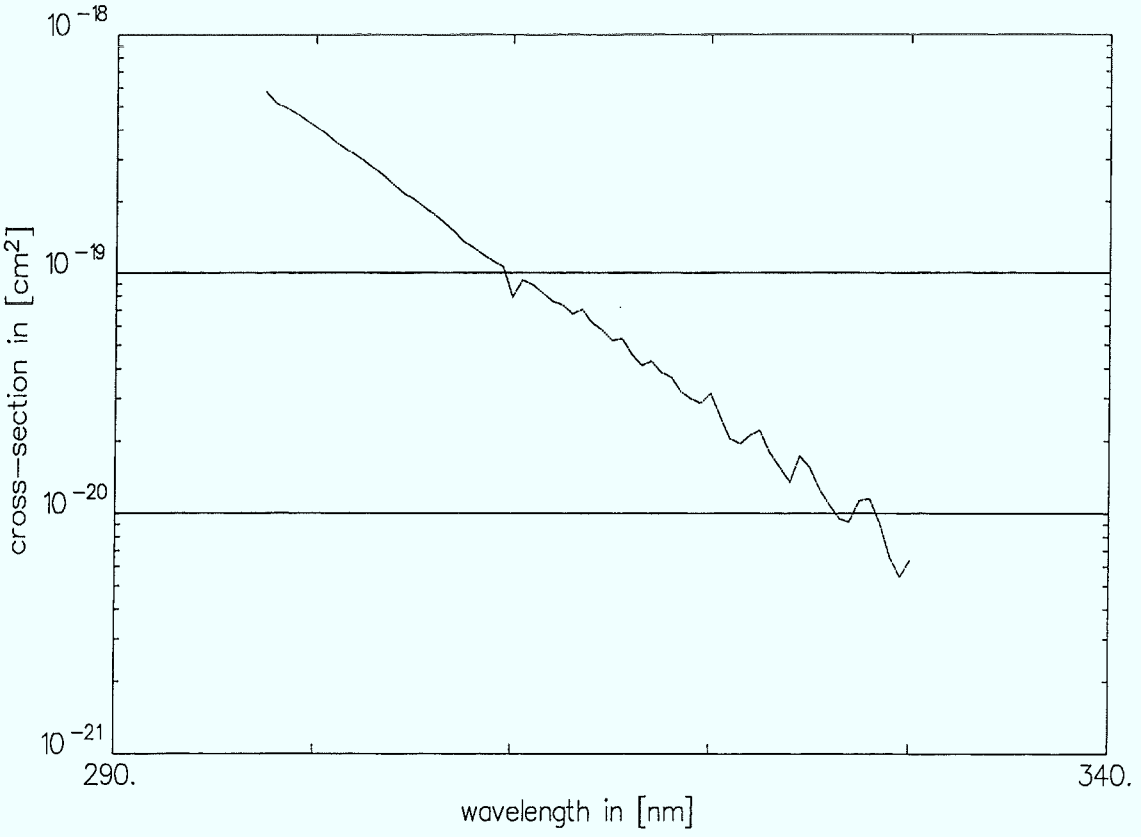
Substance: $O_3$

Reference:
Moortgat, G.K., and P. Warneck, Relative $O(^1D)$ Quantum Yields in the Near UV Photolysis of Ozone at 298 K, Z. Naturforsch., **30a** (1975), 835-844

Data: table Resolution: 0.5 nm

Temperature: 298. K

Temperature dependence: no



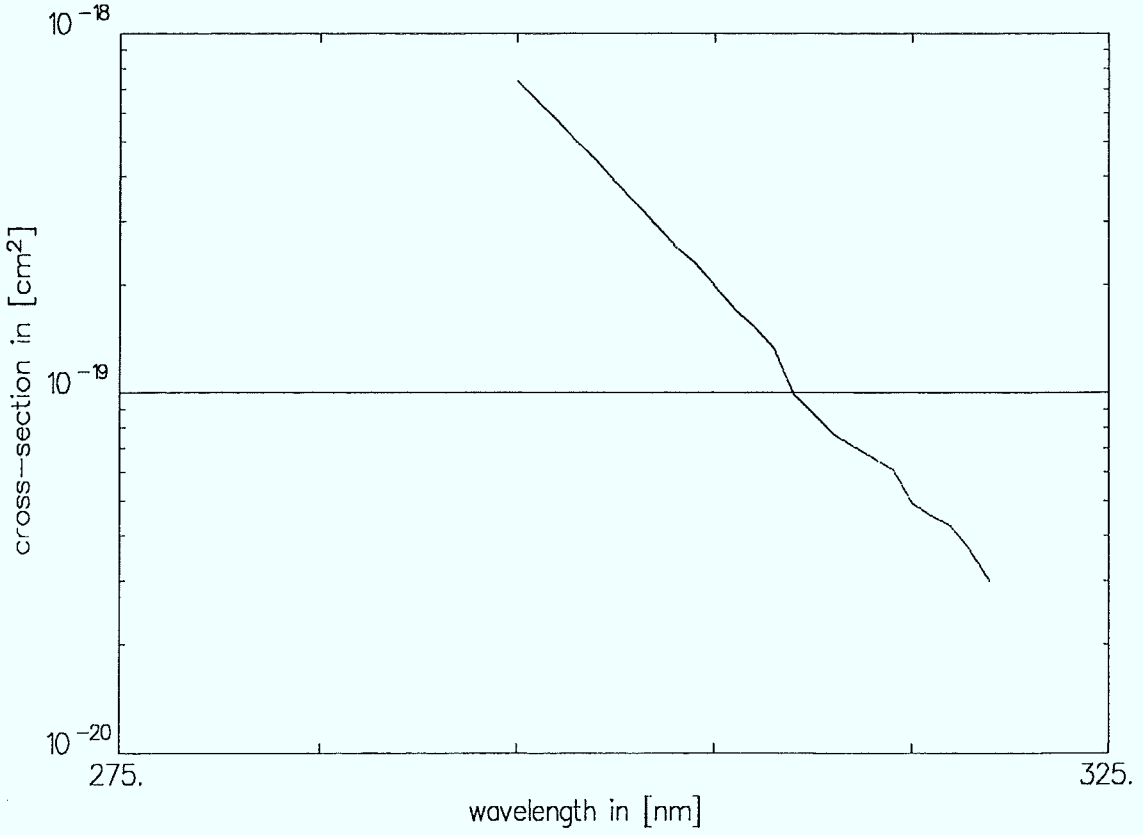
Substance: $O_3$

Reference:
Arnold, I., F.J. Comes, and G.K. Moortgat, Laser Flash Photolysis: Quantum Yield of O($^1$D) Formation from Ozone, Chem. Phys., **24** (1977), 211-217

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no



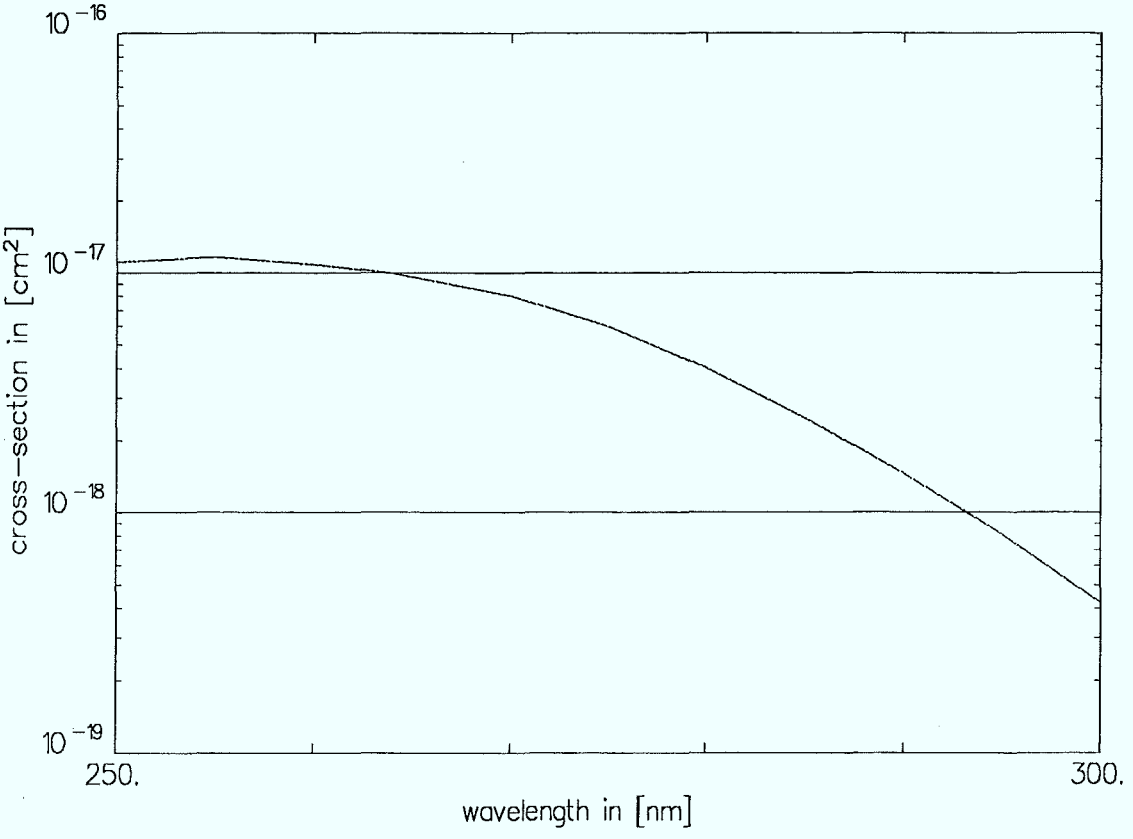
Substance: $O_3$

Reference:
Fairchild, P.W., and E.K.C. Lee, Relative Quantum Yields of $O(^1D)$ in Ozone Photolysis in the Region Between 250 and 300 nm, Chem. Phys. Lett., **60** (1978), 36-39

Data: table Resolution: 5.0 nm

Temperature: 296. K

Temperature dependence: no



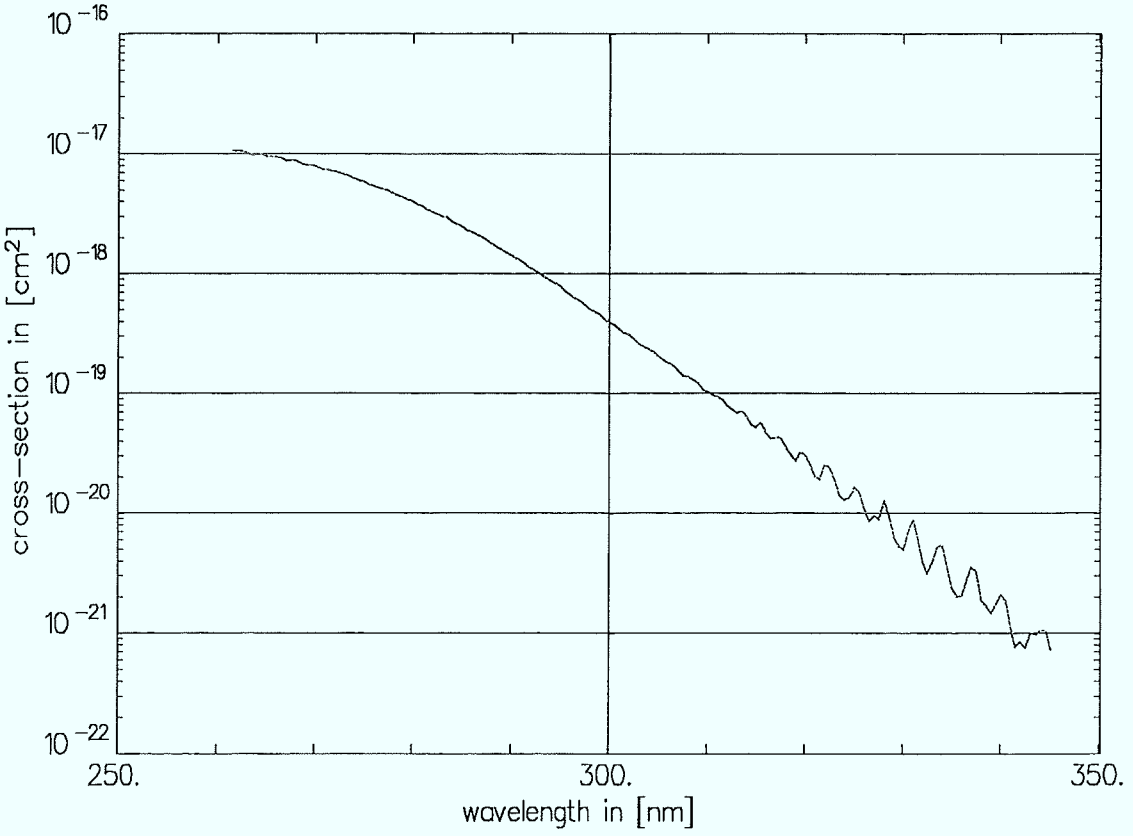
Substance: $O_3$

Reference:
A.M. Bass, and R.J. Paur, priv. comm., 1981

Data: disk Resolution: 0.5 nm

Temperature: 295. K

Temperature dependence: 295. / 243. K



Substance: $O_3$

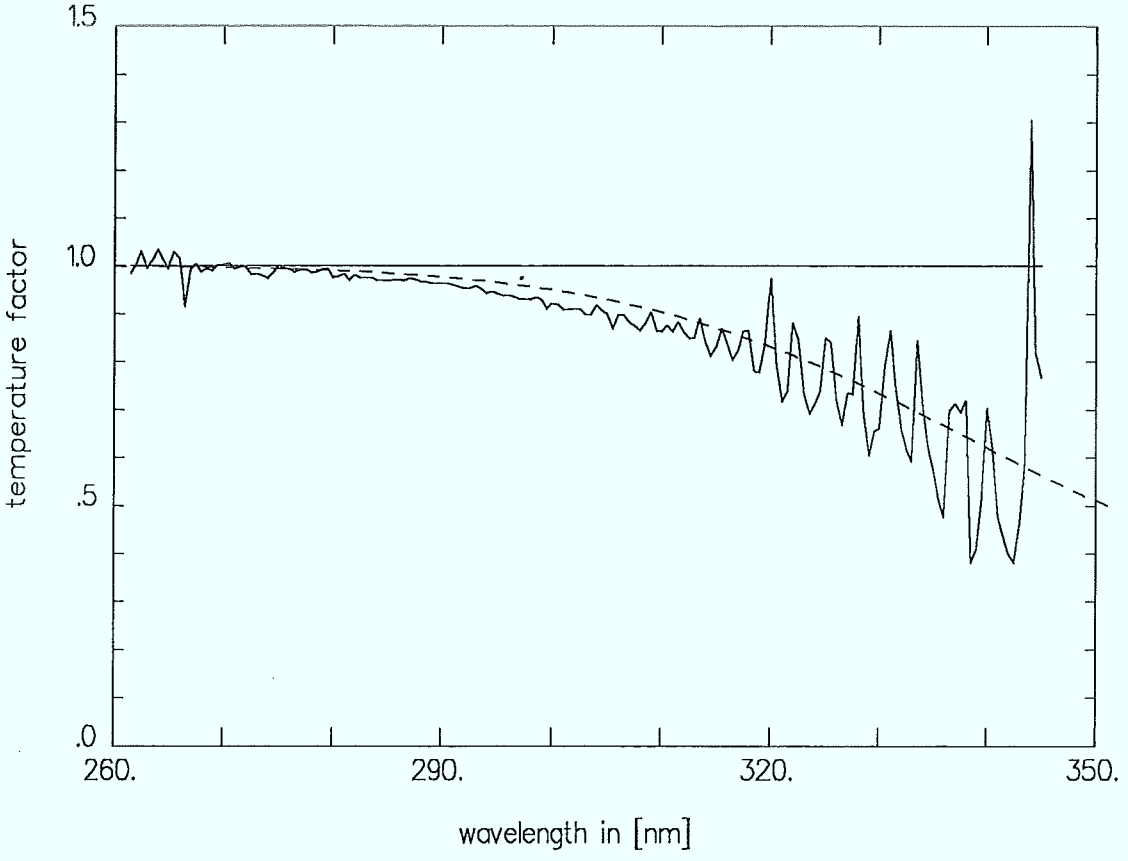
Reference:
A.M. Bass, and R.J. Paur, priv. comm., 1981

Temperatures: 295. / 243. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 1.16E-2 | b = | 0. | c = | -5.E-4 |
| d = | 0. | e = | 436. | f = | -0.27 |



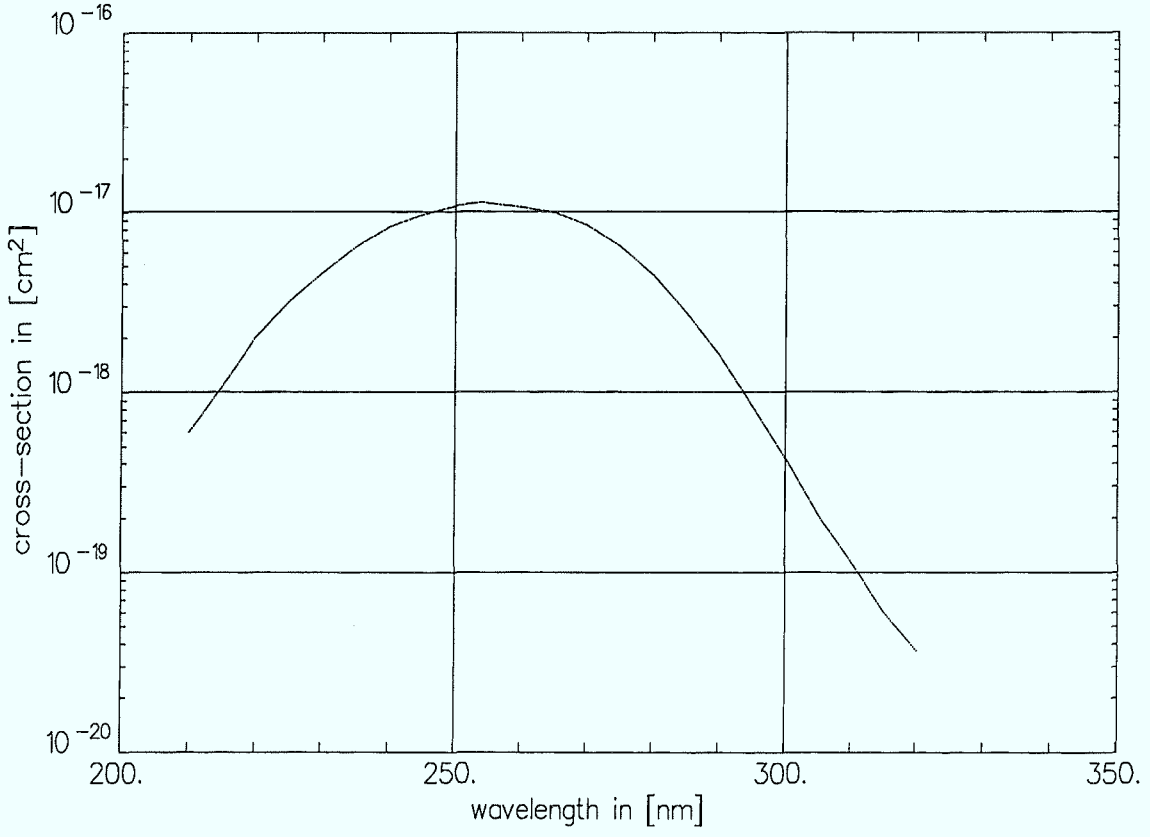
Substance: $O_3$

Reference:
Astholz, D.C., A.E. Croce, and J. Troe, Temperature Dependence of the Ozone Absorption Coefficient in the Hartley Continuum, J. Phys. Chem., **86** (1982), 696-699

Data: table Resolution: 5.0 nm

Temperature: 300. K

Temperature dependence: no



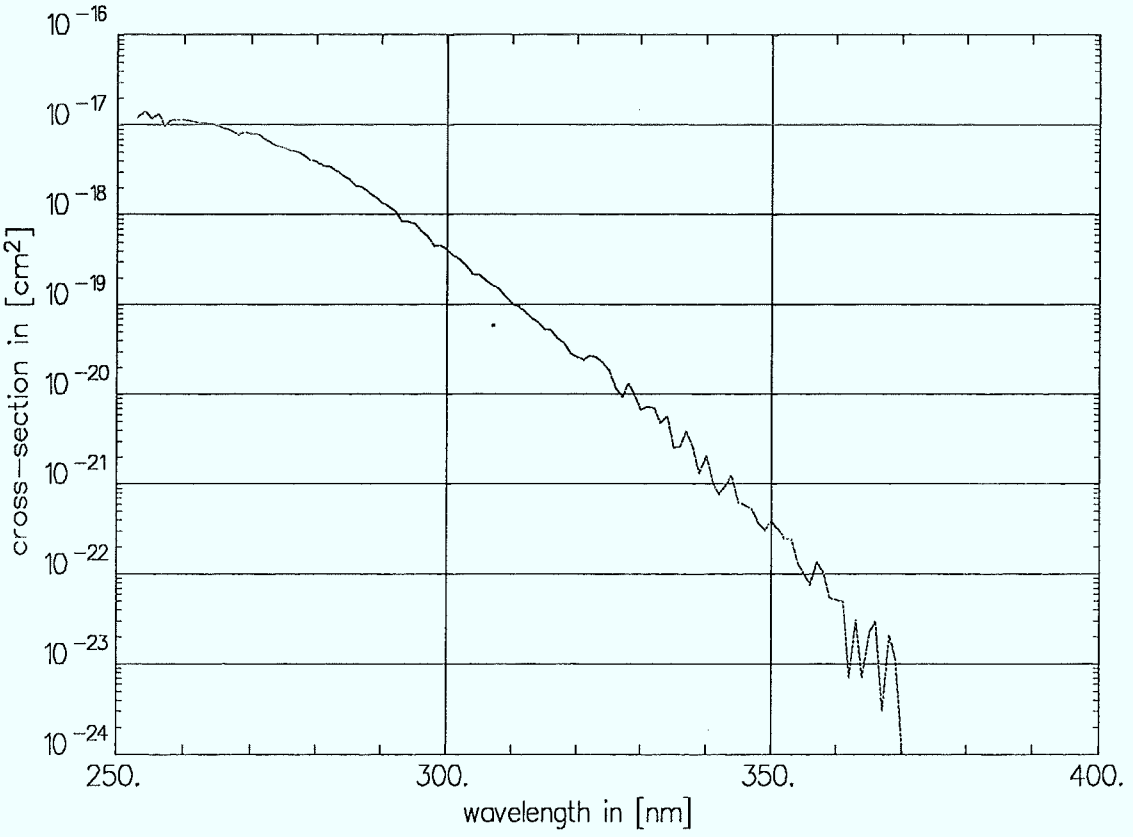
Substance: $O_3$

Reference:
Davenport, J.E., Parameters for Ozone Photolysis as a Function of Temperature at 280-330 nm, FAA-EE-80-44 R, 1982

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: 298. / 271. / 225. / 206. K



Substance: $O_3$

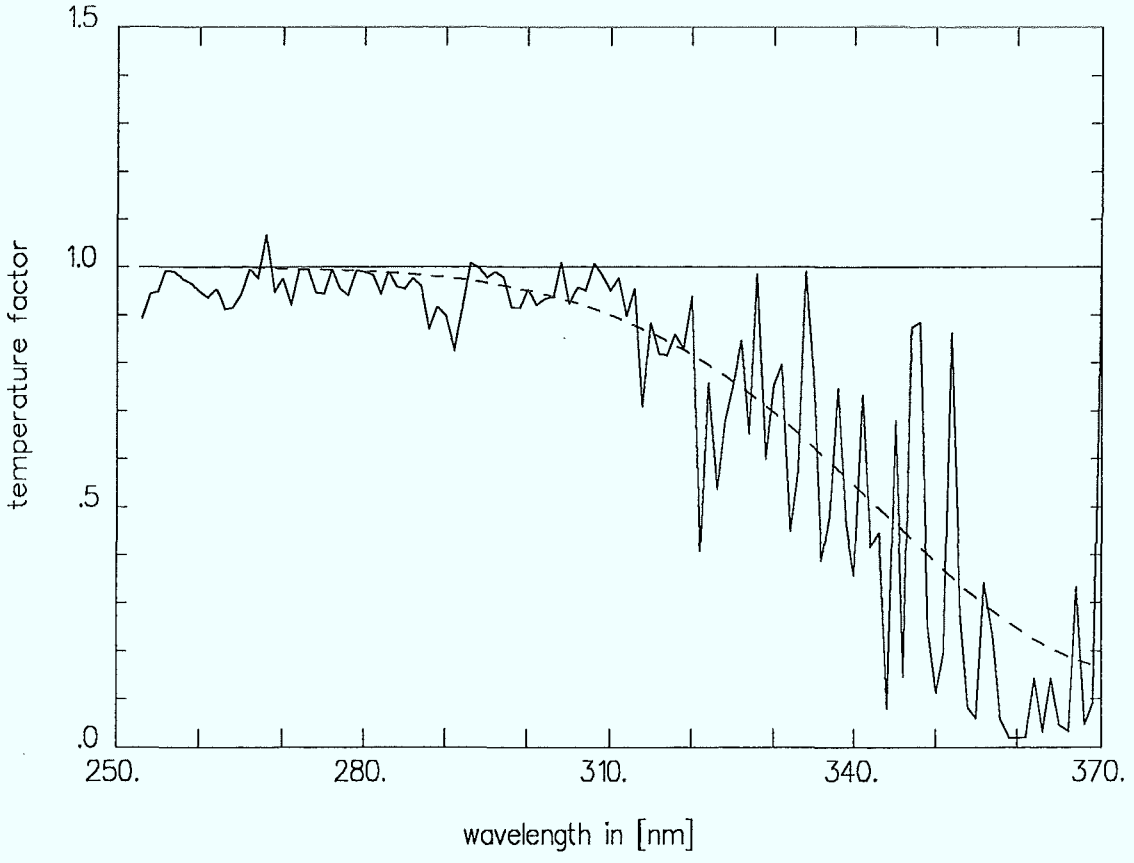
Reference:
Davenport, J.E., Parameters for Ozone Photolysis as a Function of Temperature at 280-330 nm, FAA-EE-80-44 R, 1982

Temperatures: 298. / 225. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 1.16E-2 | b = | 0. | c = | -5.E-4 |
| d = | 0. | e = | 436. | f = | -0.27 |



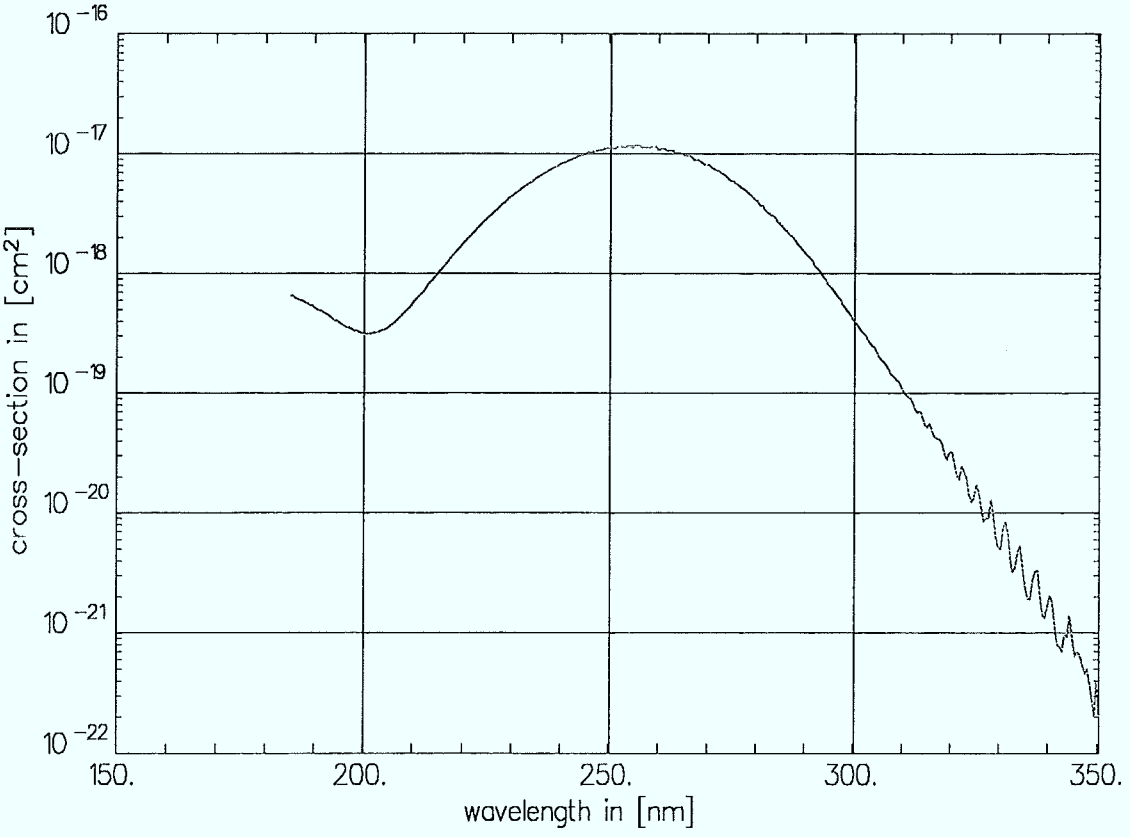
Substance: $O_3$

Reference:
Molina, L.T., and M.J. Molina, Absolute Absorption Cross Sections of Ozone in the 185- to 350-nm Wavelength Region, J. Geophys. Res., **91** (1986), 14501-14508

Data: table Resolution: 0.5 nm

Temperature: 298. K

Temperature dependence: 298. / 263. / 226. K



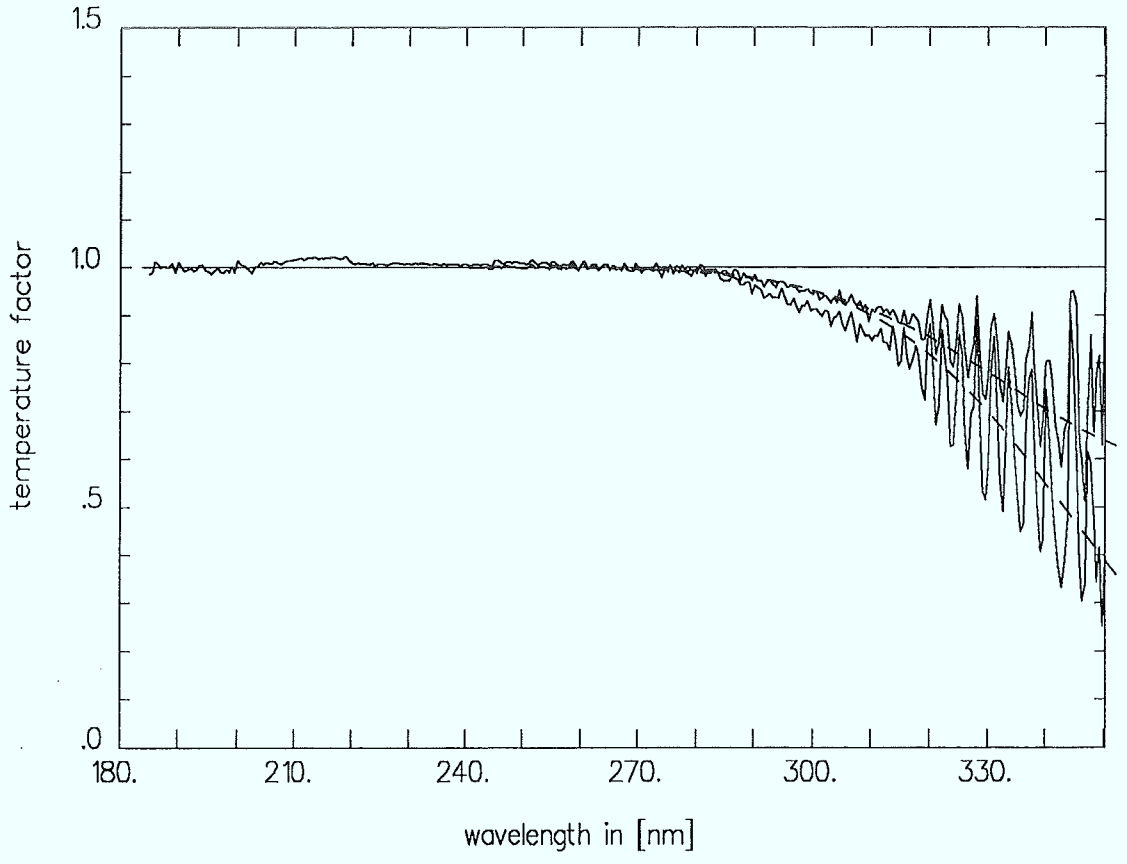
Substance: $O_3$

Reference:
Molina, L.T., and M.J. Molina, Absolute Absorption Cross Sections of Ozone in the 185- to 350-nm Wavelength Region, J. Geophys. Res., **91** (1986), 14501-14508

Temperatures: 298. / 263. / 226. K

Function: 2

| Fit Parameter: | a = | 1.16E-2 | b = | 0. | c = | -5.E-4 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 436. | f = | -0.27 |



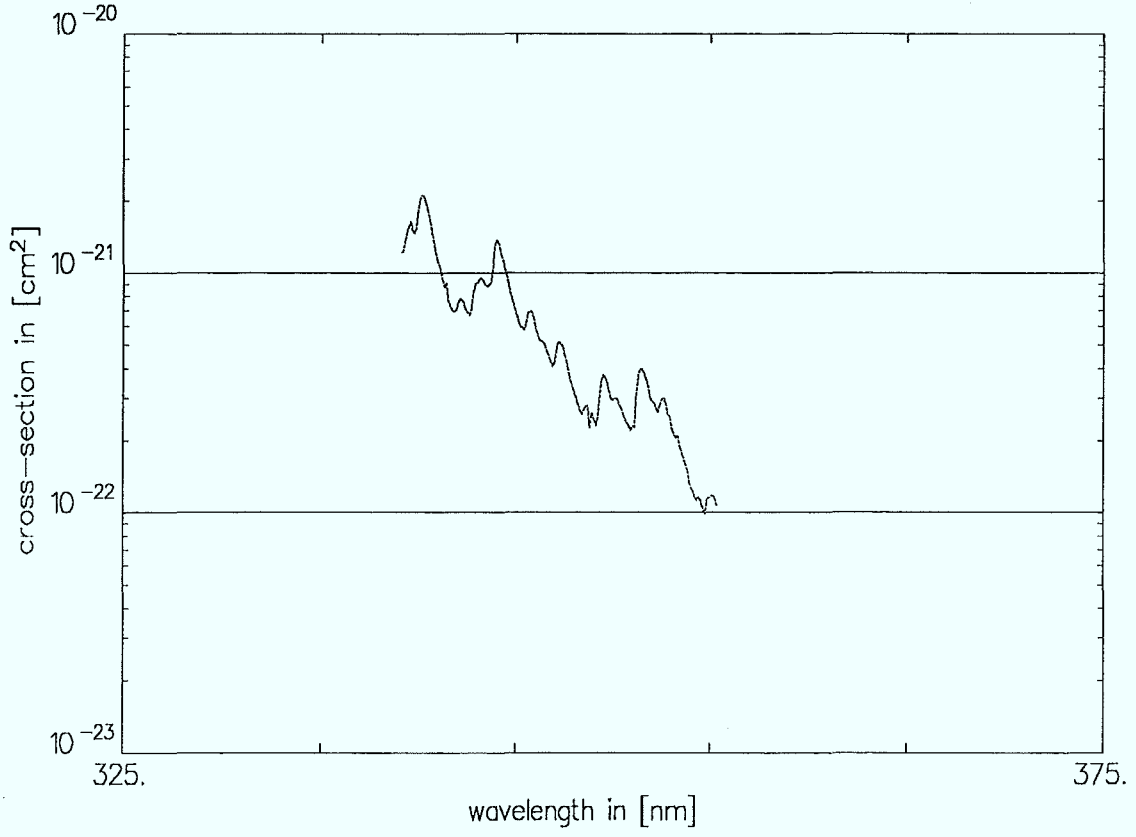
Substance: $O_3$

Reference:
Cacciani, M., A. Di Sarra, G. Fiocco, and A. Amoruso, Absolute Determination of the Cross Sections of Ozone in the Wavelength Region 339-355 nm at Temperatures 220-293 K, J. Geophys. Res., **94** (1989), 8485-8490

Data: table Resolution: 1.0 nm

Temperature: 293. K

Temperature dependence: 293. / 220. K



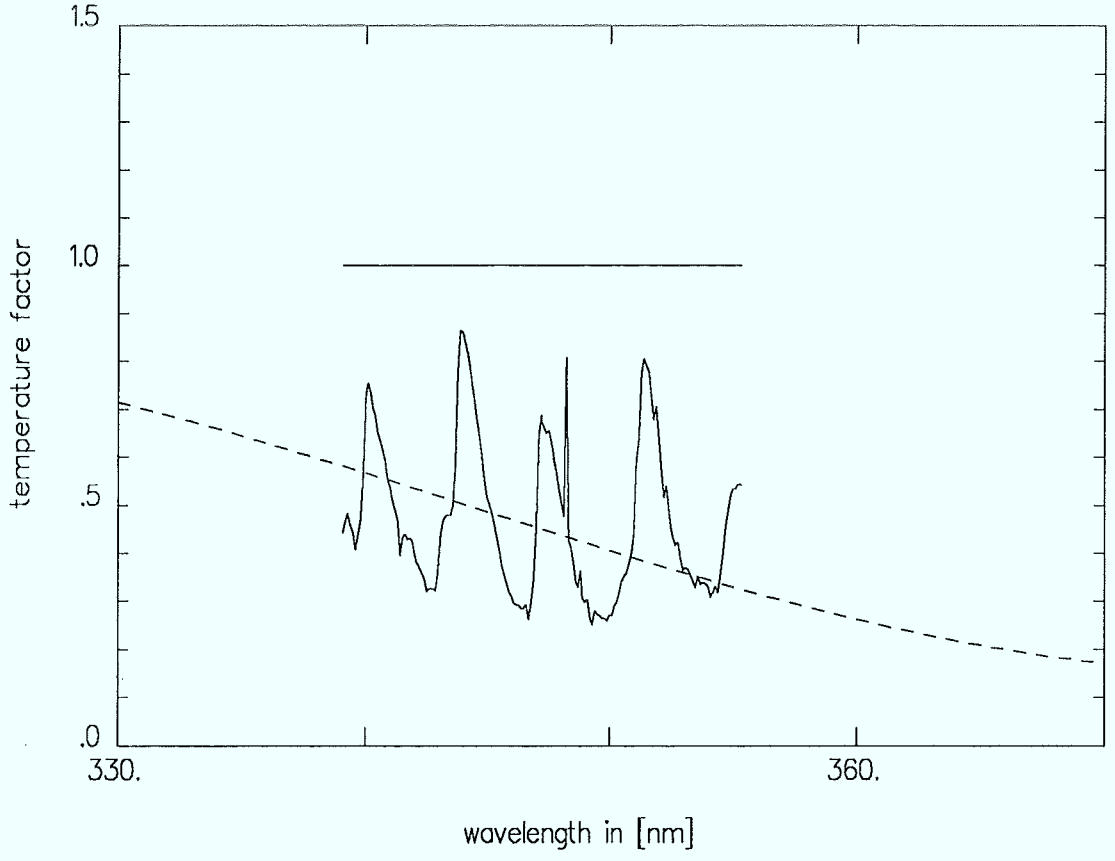
Substance: $O_3$

Reference:
Cacciani, M., A. Di Sarra, G. Fiocco, and A. Amoruso, Absolute Determination of the Cross Sections of Ozone in the Wavelength Region 339-355 nm at Temperatures 220-293 K, J. Geophys. Res., **94** (1989), 8485-8490

Temperatures: 293. / 220. K

Function: 2

| Fit Parameter: | a = | 1.16E-2 | b = | 0. | c = | -5.E-4 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 436. | f = | -0.27 |



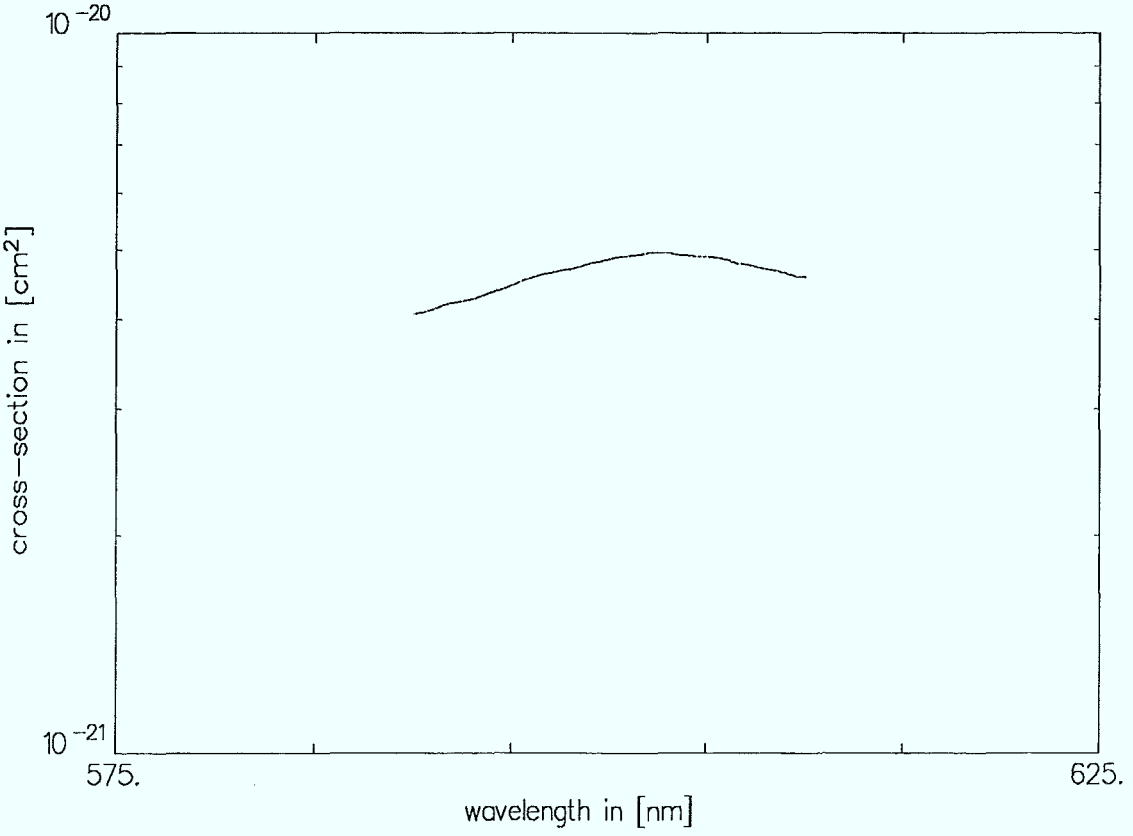
Substance: $O_3$

Reference:
Amoruso, A., M. Cacciani, A. Di Sarra, and G. Fiocco, Absorption Cross Sections of Ozone in the 590- to 610-nm Region at $T$ = 230 K and $T$ = 299 K, J. Geophys. Res., **95** (1990), 20565-20568

Data: table Resolution: 0.5 nm

Temperature: 299. K

Temperature dependence: 299. / 230. K

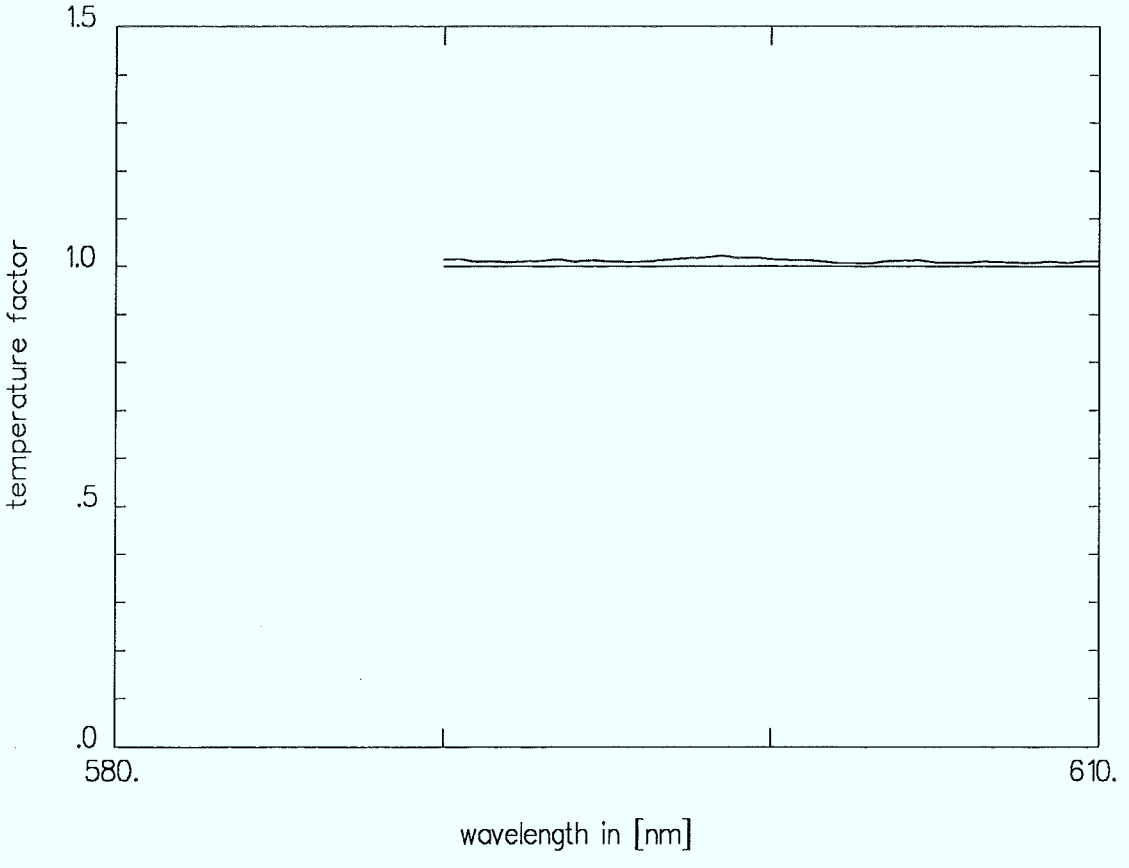


Substance: $O_3$

Reference:
Amoruso, A., M. Cacciani, A. Di Sarra, and G. Fiocco, Absorption Cross Sections of Ozone in the 590- to 610-nm Region at $T$ = 230 K and $T$ = 299 K, J. Geophys. Res., **95** (1990), 20565-20568

Temperatures: 299. / 230. K

Function: not fitted



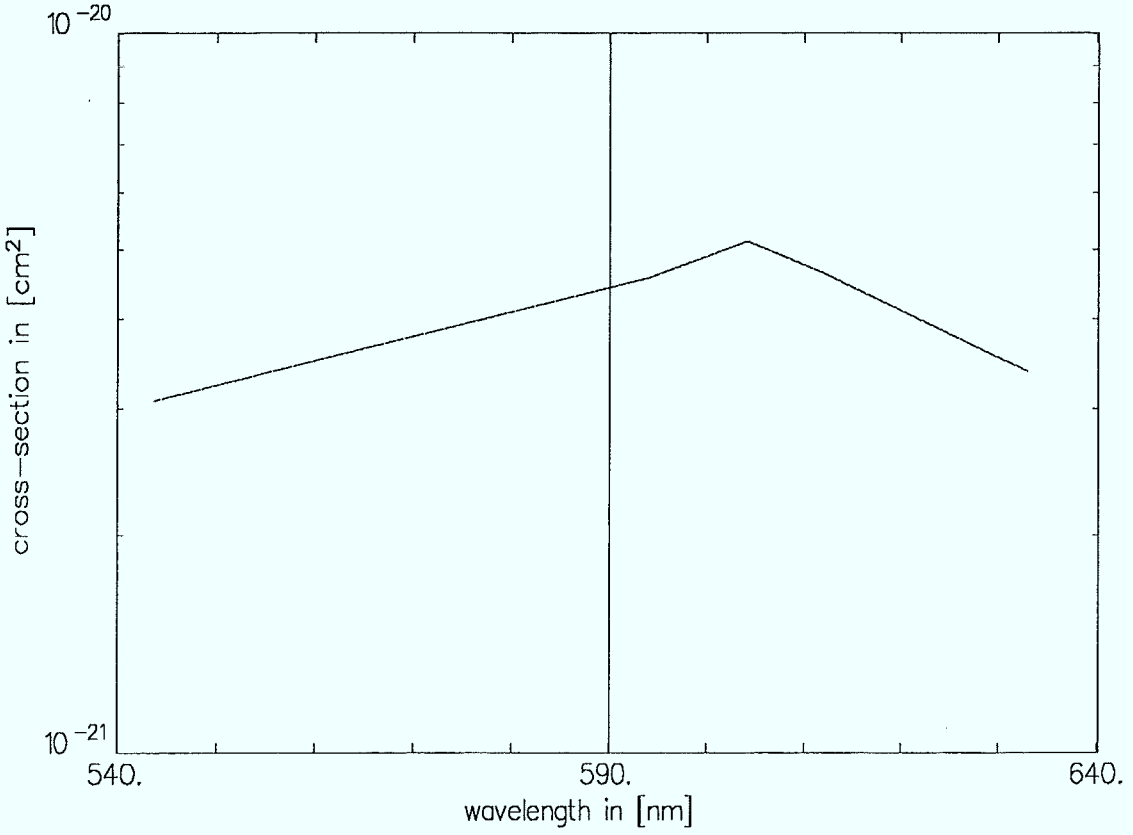
Substance: $O_3$

Reference:
Anderson, S.M., and K. Mauersberger, Laser Measurements of Ozone Absorption Cross Sections in the Chappuis Band, Geophys. Res. Lett., **19** (1992), 933-936

Data: table

Temperature: 298. K

Temperature dependence: no



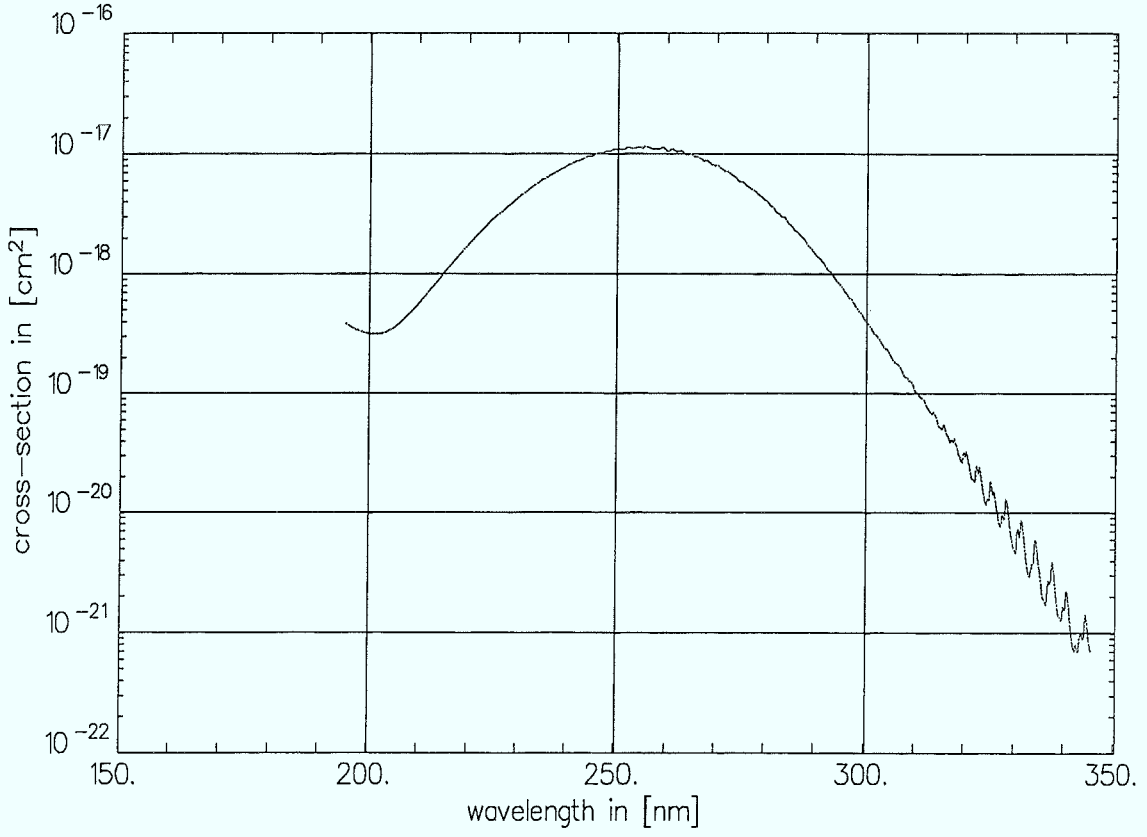
Substance: $O_3$

Reference:
Daumont, D., J. Brion, J. Charbonnier, and J. Malicet, Ozone UV Spectroscopy I: Absorption Cross-Section at Room Temperature, J. Atmos. Chem., **15** (1992), 145-155 and J. Malicet, D.Daumont, J. Charbonnier, C.Parisse, A. Chakir and J. Brion, Ozone UV Spectroscopy II: Absorption Cross-Sections and Temperature Dependence, J. Atmos. Chem., **21** (1995), 263-273

Data: disk Resolution: 0.1 nm

Temperature: 298. K

Temperature dependence: 298. / 273. / 243. / 228. / 218. K



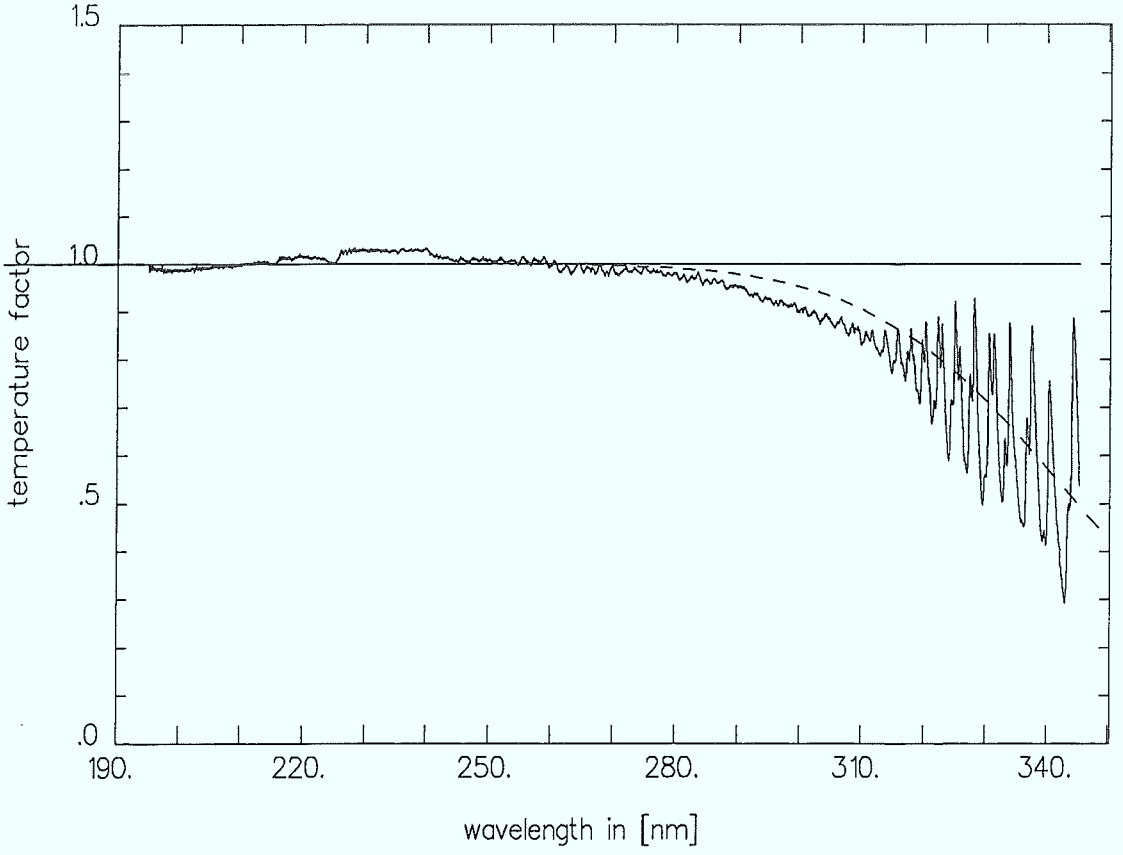
Substance: $O_3$

Reference:
Daumont, D., J. Brion, J. Charbonnier, and J. Malicet, Ozone UV Spectroscopy I: Absorption Cross-Section at Room Temperature, J. Atmos. Chem., **15** (1992), 145-155 and J. Malicet, D.Daumont, J. Charbonnier, C.Parisse, A. Chakir and J. Brion, Ozone UV Spectroscopy II: Absorption Cross-Sections and Temperature Dependence, J. Atmos. Chem., **21** (1995), 263-273

Temperatures: 295. / 228. K

Function: 2

| Fit Parameter: | a = | 1.16E-2 | b = | 0. | c = | -5.E-4 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 436. | f = | -0.27 |



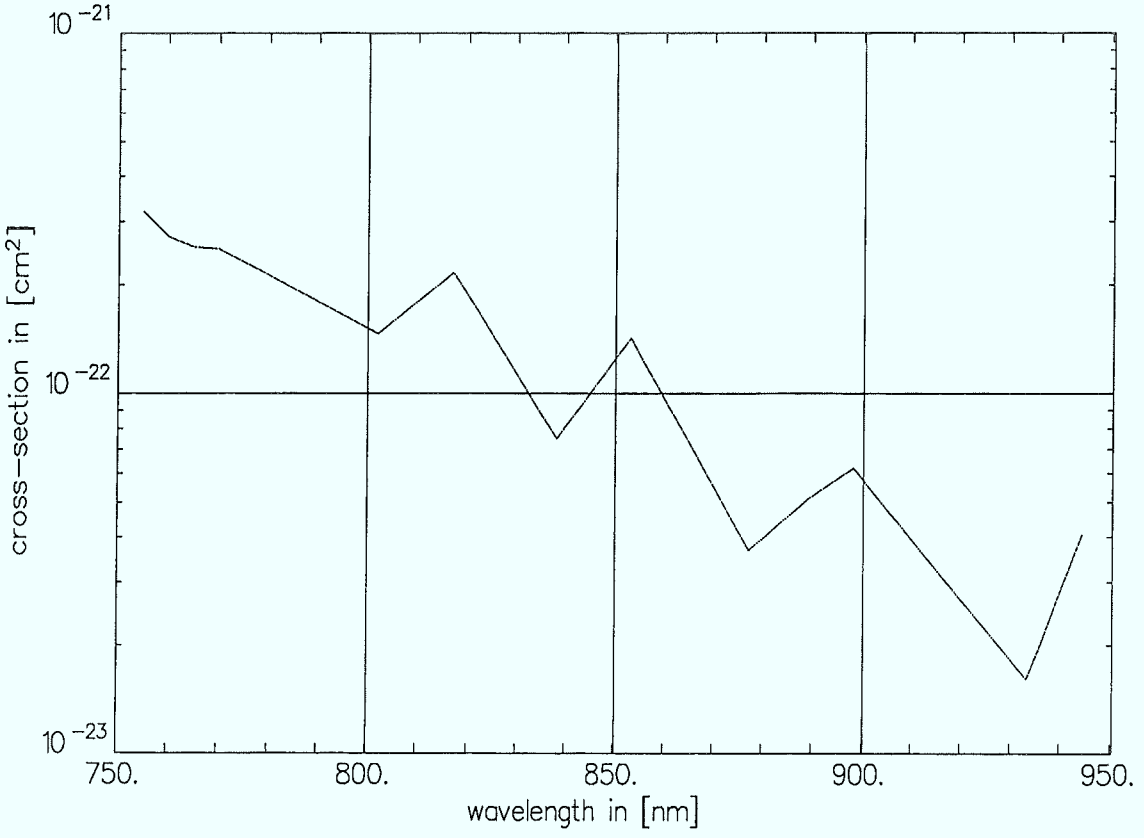
Substance: $O_3$

Reference:
Anderson, S.M., P. Hupalo, and K. Mauersberger, Ozone Absorption Cross Section Measurements in the Wulf Bands, Geophys. Res. Lett., **20** (1993), 1579-1582

Data: table Resolution: 5.0 - 35.0 nm

Temperature: 294. K

Temperature dependence: no



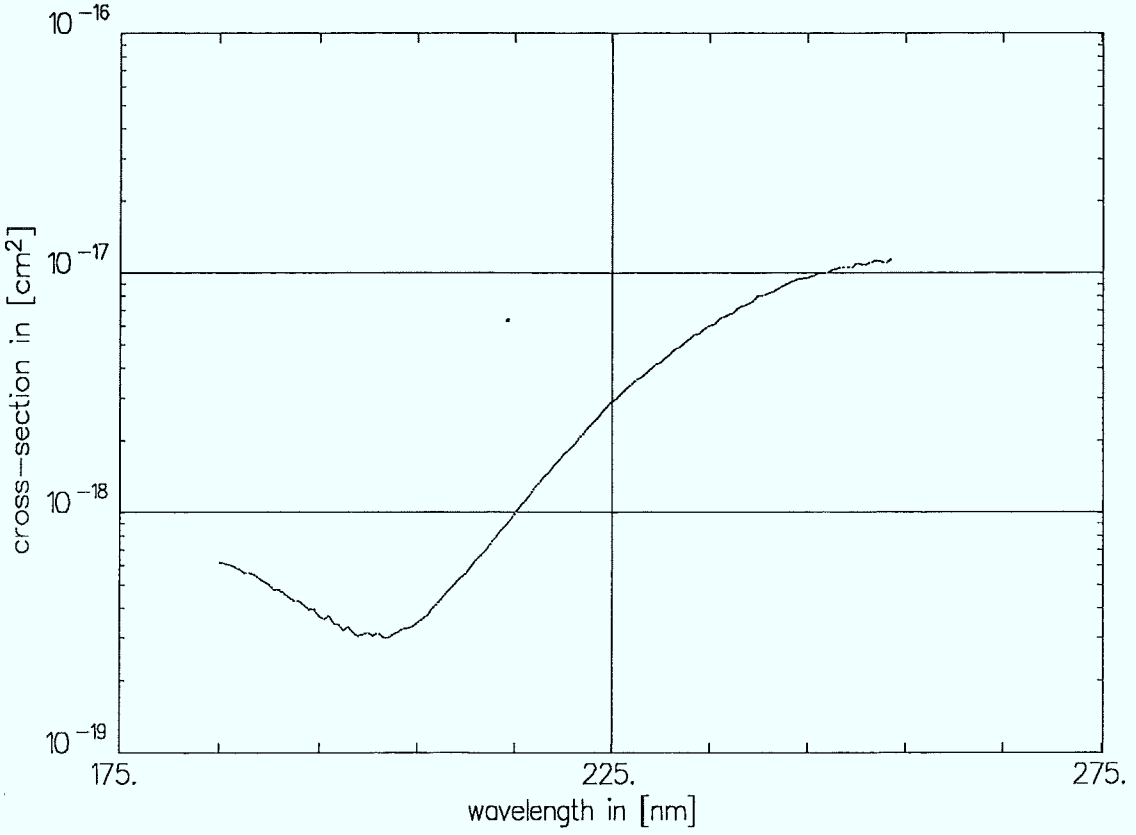
Substance: $O_3$

Reference:
Yoshino, K., J.R. Esmond, D.E. Freeman, and W.H. Parkinson, Measurements of Absolute Absorption Cross Sections of Ozone in the 185- to 254-nm Wavelength Region and the Temperature Dependence, J. Geophys. Res., **98** (1993), 5205-5211

Data: table Resolution: 0.5 nm

Temperature: 295. K

Temperature dependence: 295. / 228. / 195. K

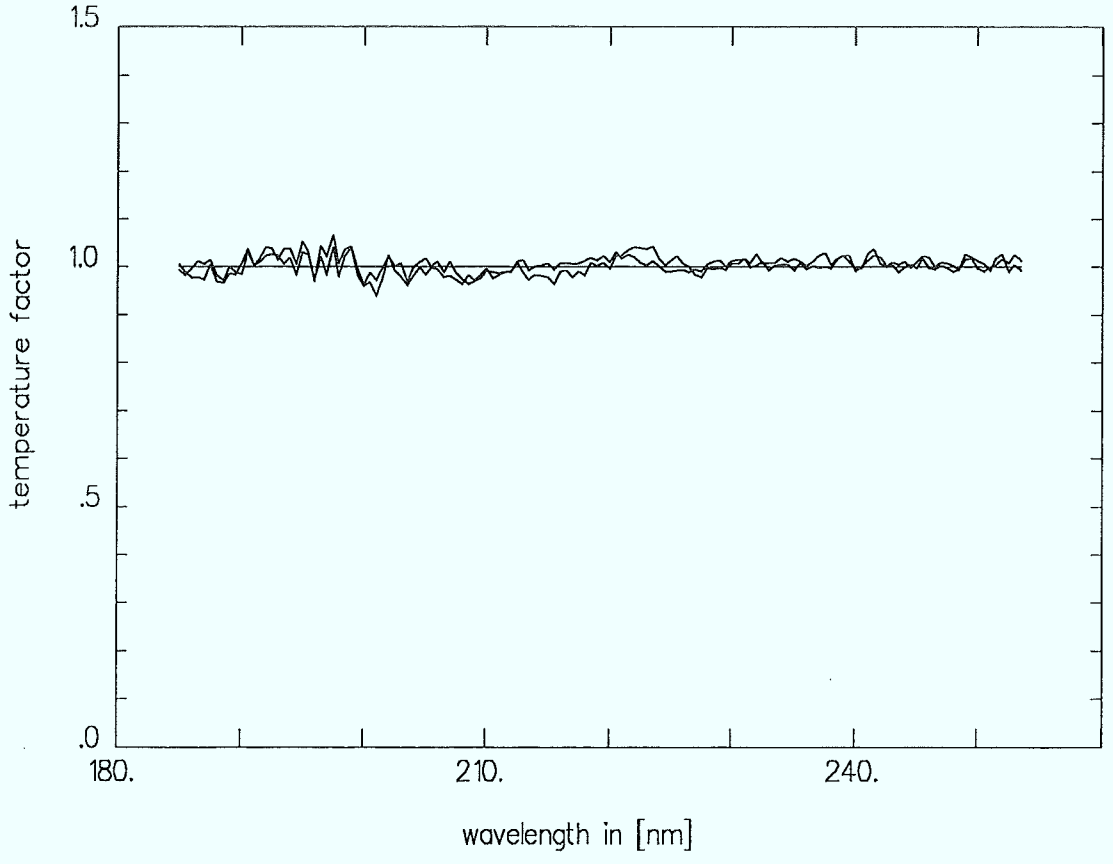


Substance: $O_3$

Reference:
Yoshino, K., J.R. Esmond, D.E. Freeman, and W.H. Parkinson, Measurements of Absolute Absorption Cross Sections of Ozone in the 185- to 254-nm Wavelength Region and the Temperature Dependence, J. Geophys. Res., **98** (1993), 5205-5211

Temperatures: 295. / 228. / 195. K

Function: not fitted



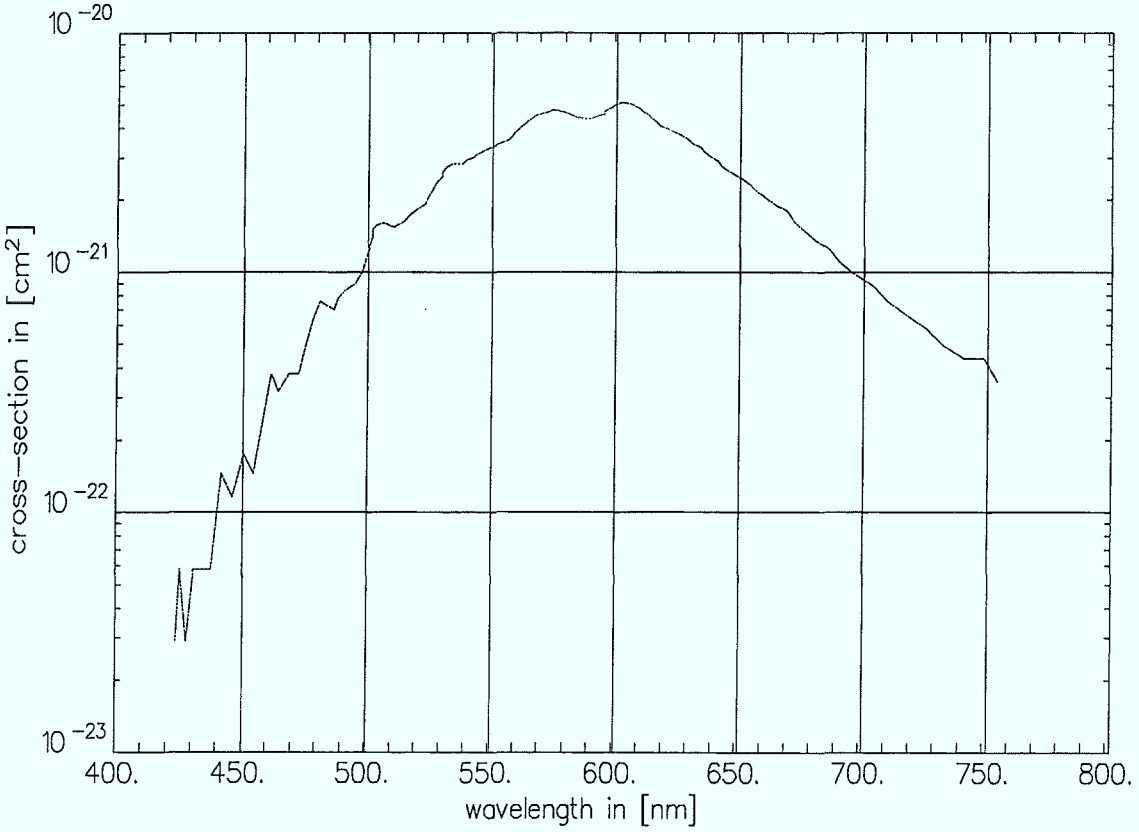
Substance: $O_3$

Reference:
Burkholder, J.B., and R.K. Talukdar, Temperature Dependence of the Ozone Absorption Spectrum over the Wavelength Range 410 to 760 nm, Geophys. Res. Lett., **21** (1994), 581-584

Data: diagram

Temperature: 298. K

Temperature dependence: no



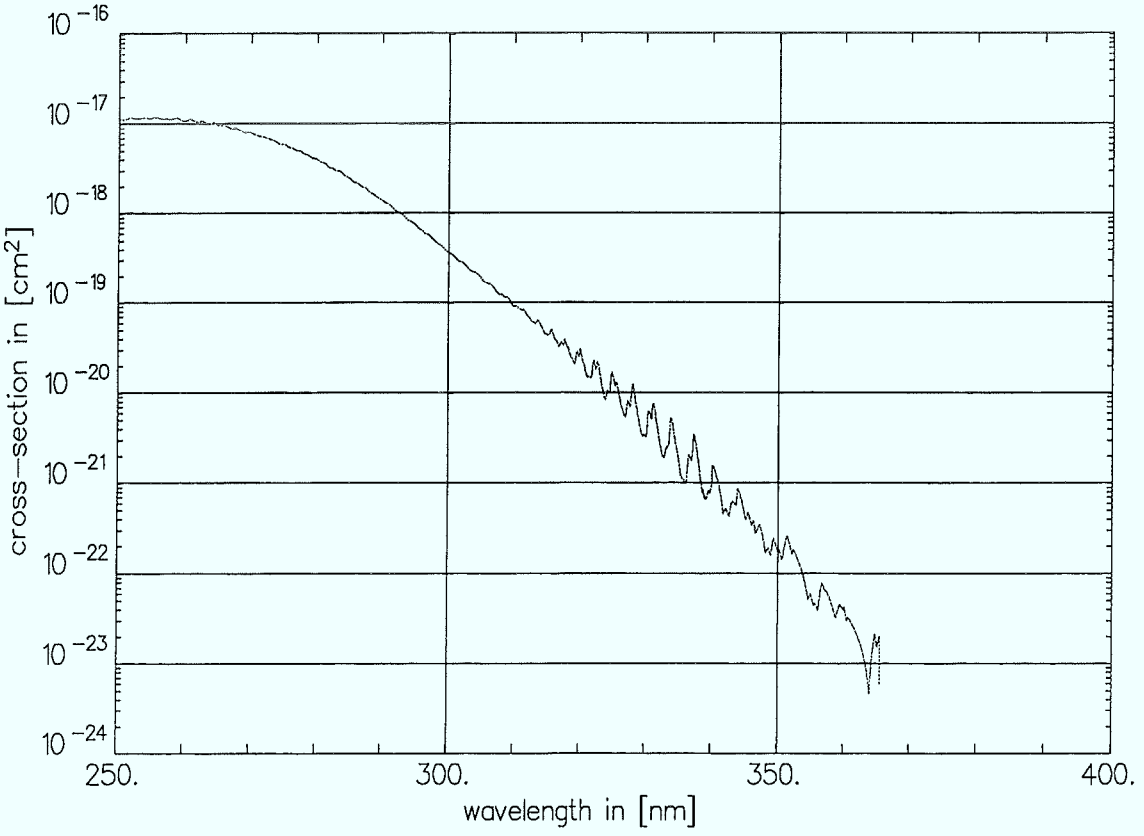
Substance: $O_3$

Reference:
A.M. Bass

Data: disk Resolution: 0.03 nm

Temperature: 250. K

Temperature dependence: no



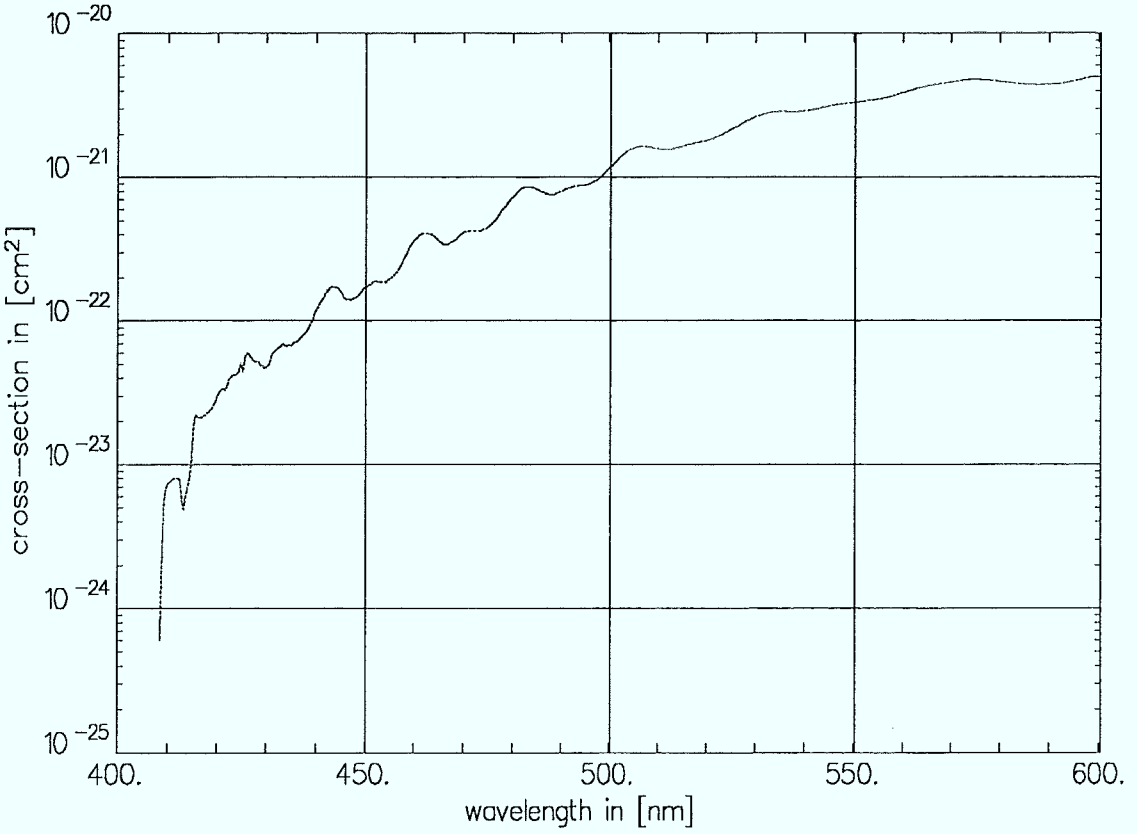
Substance: $O_3$

Reference:
H.S. Johnston

Data: disk Resolution: 0.4 nm

Temperature: 298. K

Temperature dependence: no



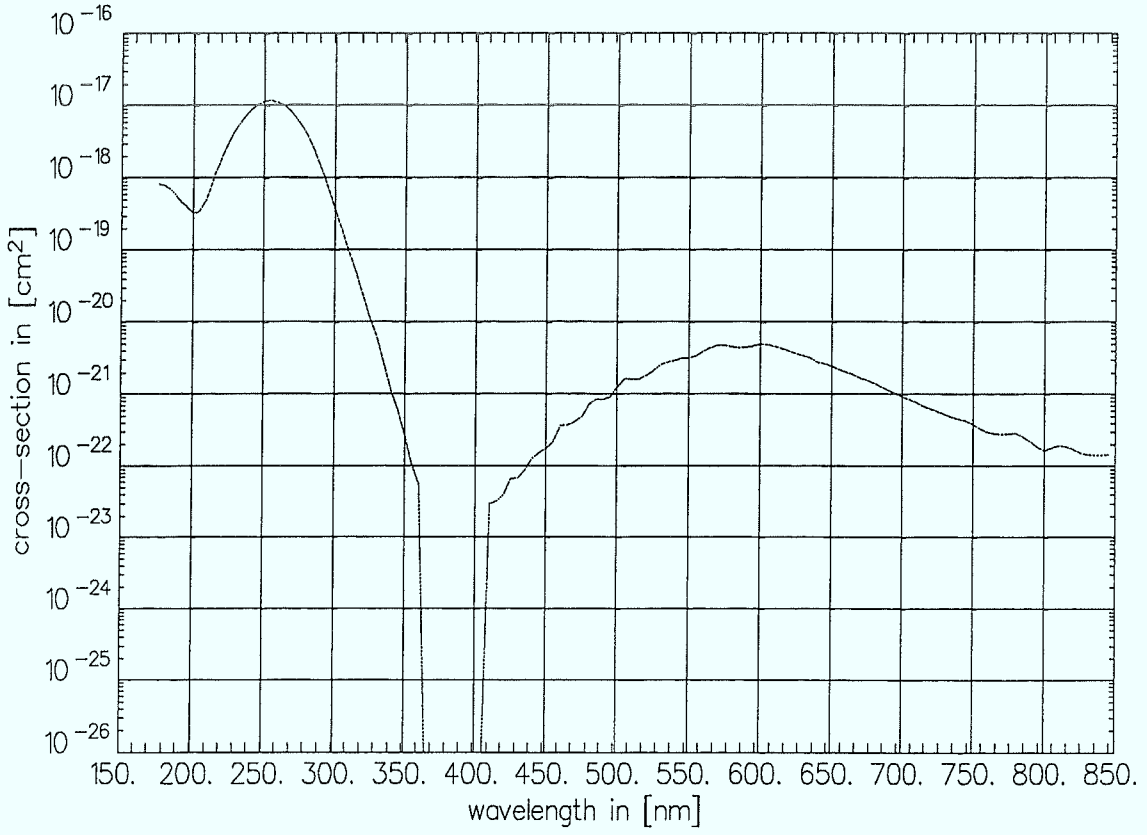
Substance: $O_3$

Reference:
WMO, 1975

Data: table Resolution: 0.57 - 5.0 nm

Temperature: 298. K

Temperature dependence: no



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

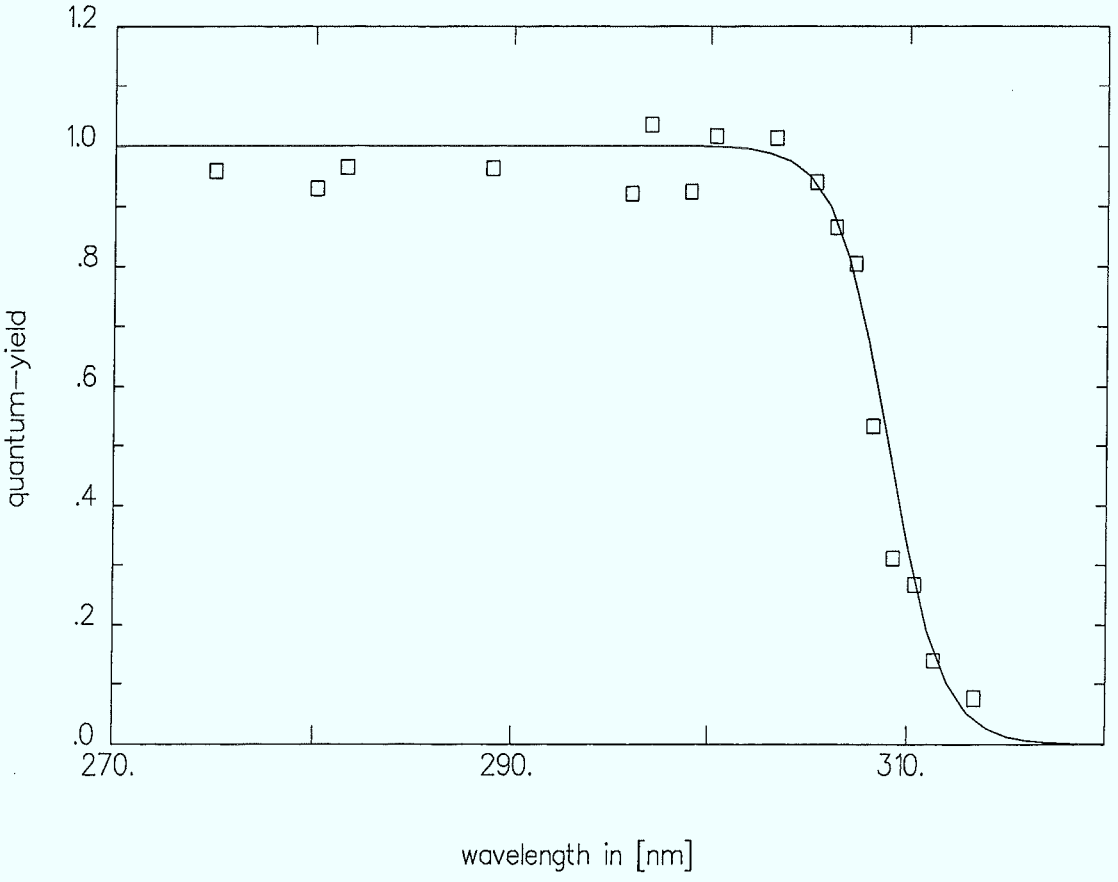
Reference:
Lin, C.-L., and W.B. DeMore, $O(^1D)$ Production in Ozone Photolysis Near 3100A, J. Photochem., 2 (1973/74), 161-164

Data: diagram

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 0.73 $\lambda_1$ = 309.



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

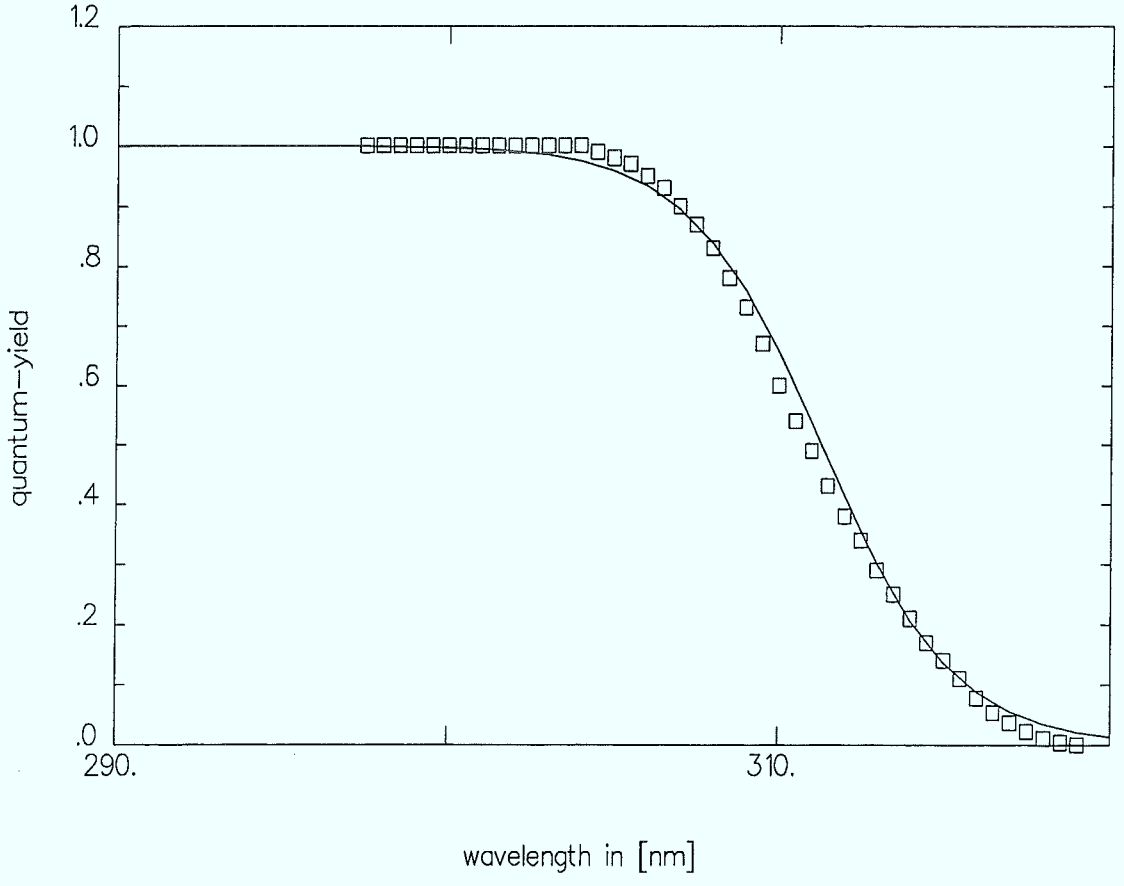
Reference:
Moortgat, G.K., and P. Warneck, Relative $O(^1D)$ Quantum Yields in the Near U.V. Photolysis of Ozone at 298 K, Z. Naturforsch., **30a** (1975), 835-844

Data: table Resolution: 0.5 nm

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 0.5 $\lambda_1$ = 311.3



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

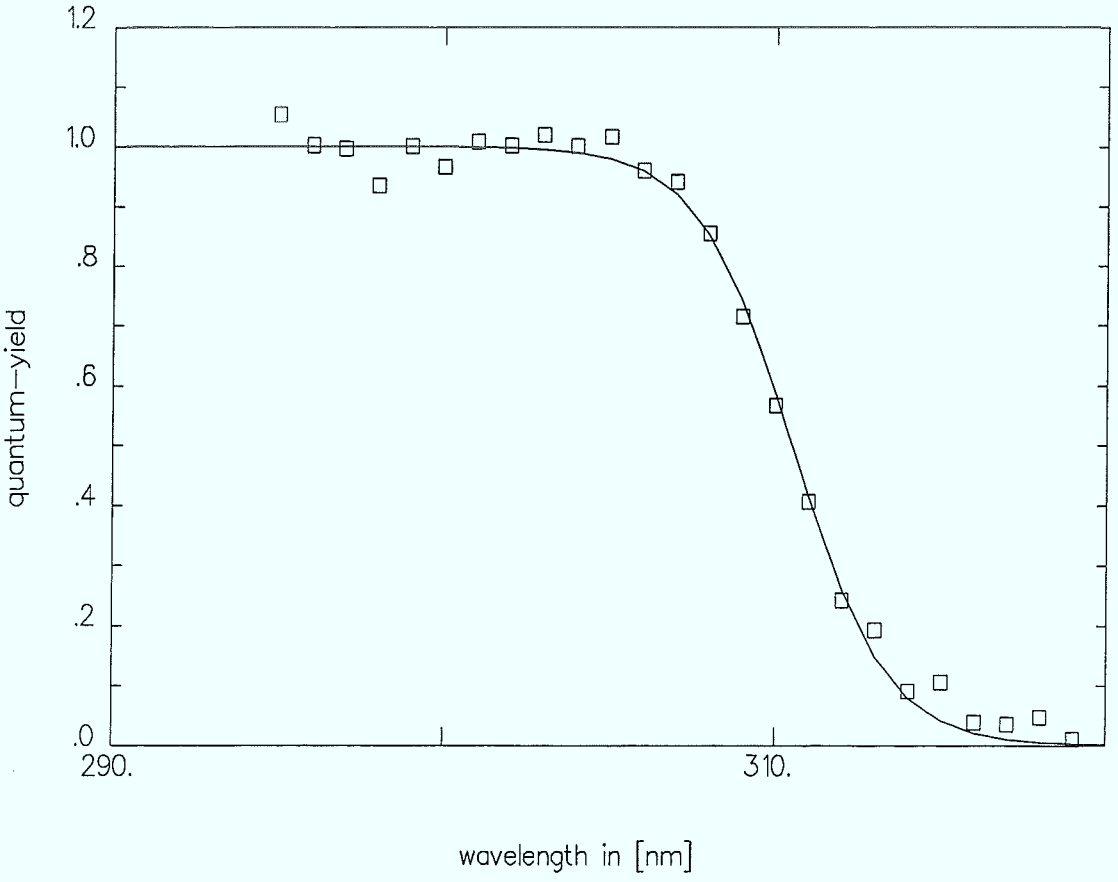
Reference:
Arnold, I., F.J. Comes, and G.K. Moortgat, Laser Flash Photolysis: Quantum Yield of $O(^1D)$ Formation from Ozone, Chem. Phys., **24** (1977), 211-217

Data: table Resolution: 1.0 nm

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 0.7 $\lambda_1$ = 310.5



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

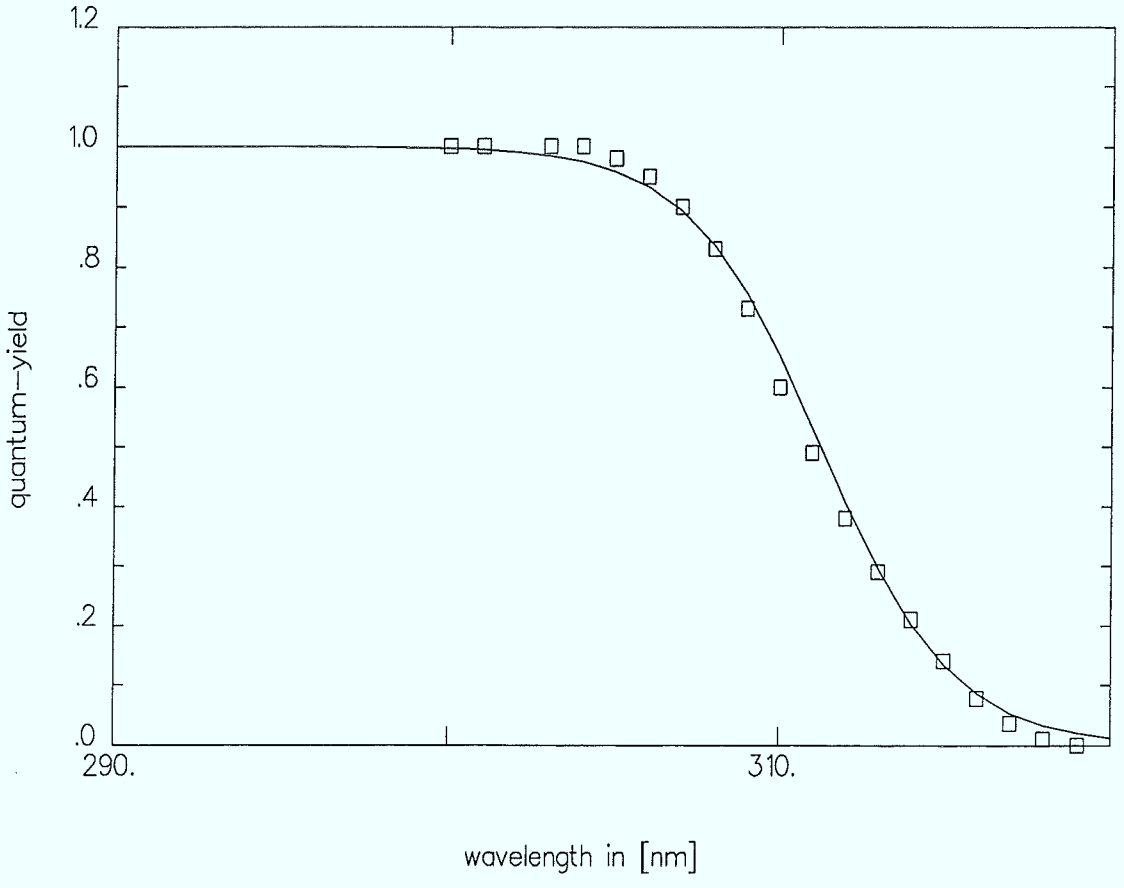
Reference:
Moortgat, G.K., E. Kudzus, and P. Warneck, Temperature Dependence of $O(^1D)$ Formation in the Near U.V. Photolysis of Ozone, J. Chem. Soc. Faraday. Trans., **73** (1977), 1216-1221

Data: table Resolution: 1.0 nm

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 1.352-0.0286*T $\lambda_1$ = 299.75+0.0386*T



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

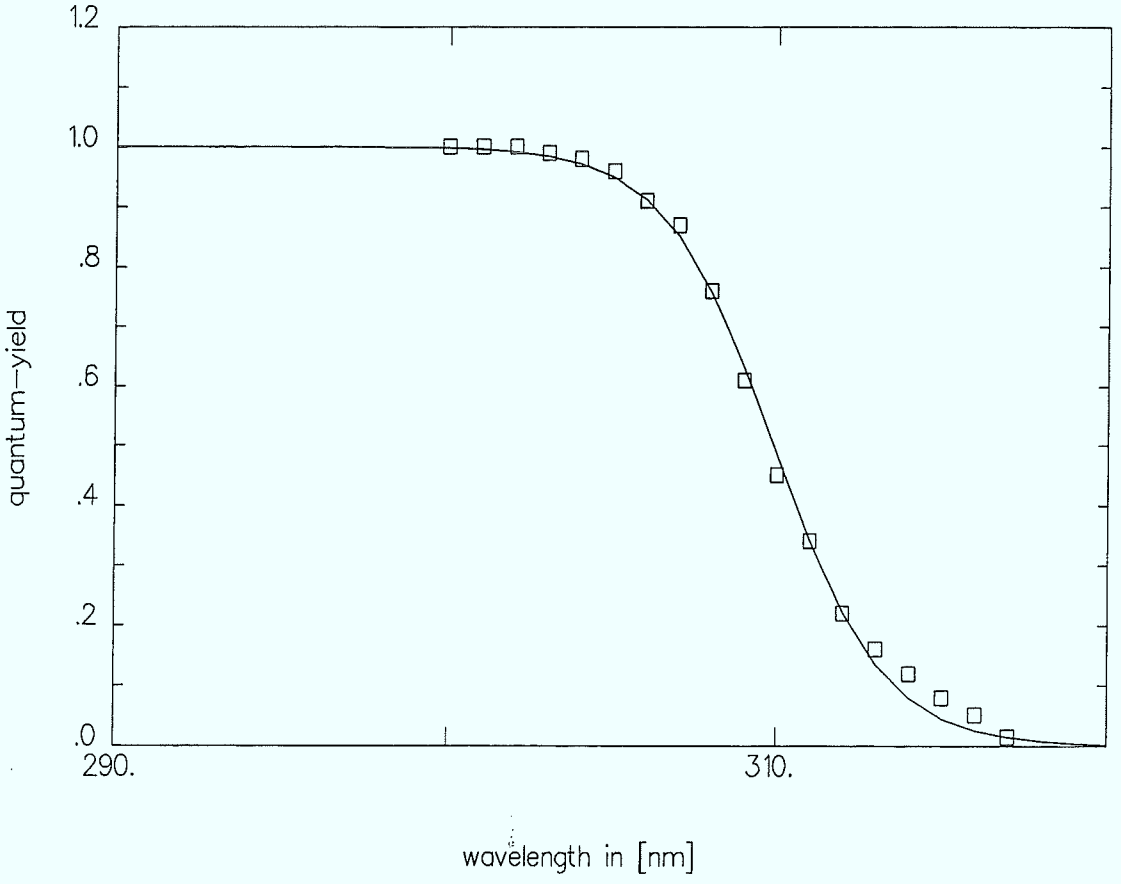
Reference:
Moortgat, G.K., E. Kudzus, and P. Warneck, Temperature Dependence of $O(^1D)$ Formation in the Near U.V. Photolysis of Ozone, J. Chem. Soc. Faraday. Trans., **73** (1977), 1216-1221

Data: table Resolution: 1.0 nm

Temperature: 263. K

Function: 2

Fit Parameter: A = 1.0 B = 1.352-0.0286*T $\lambda_1$ = 299.75+0.0386*T



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

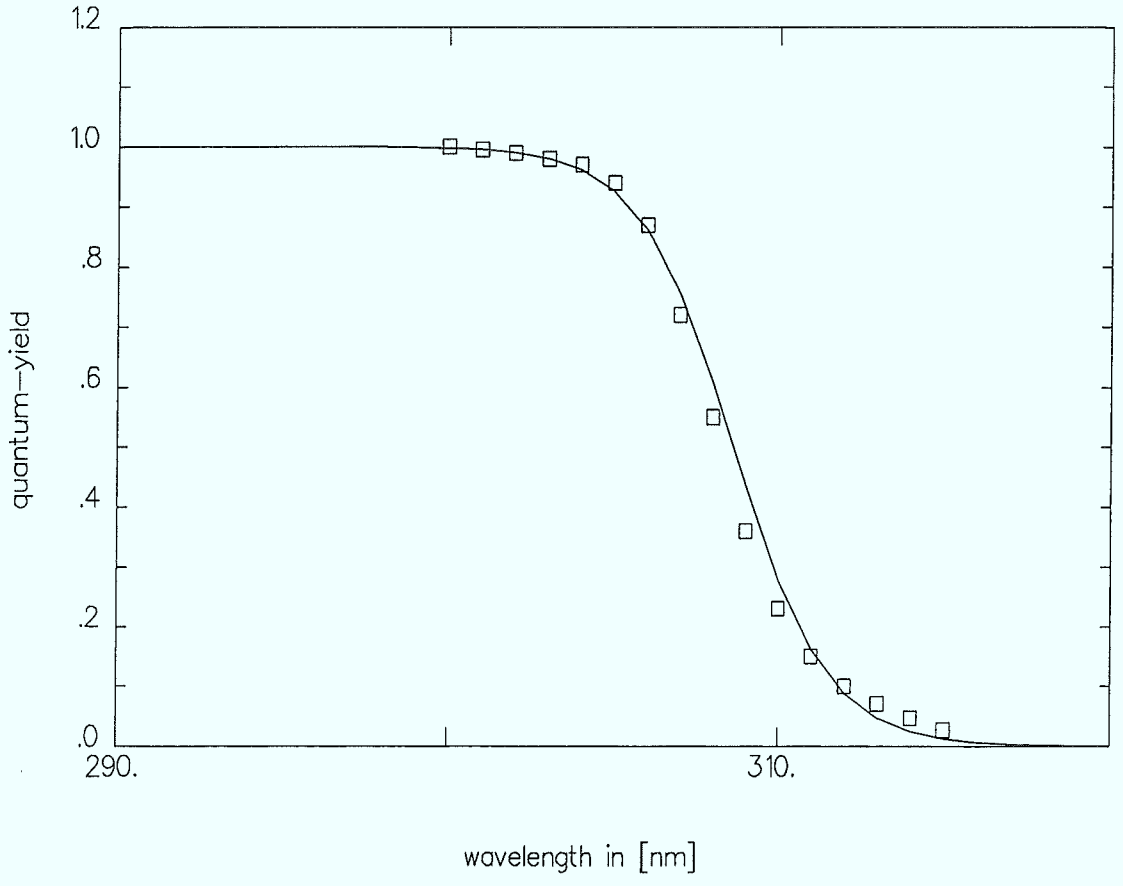
Reference:
Moortgat, G.K., E. Kudzus, and P. Warneck, Temperature Dependence of $O(^1D)$ Formation in the Near U.V. Photolysis of Ozone, J. Chem. Soc. Faraday. Trans., **73** (1977), 1216-1221

Data: table Resolution: 1.0 nm

Temperature: 230. K

Function: 2

Fit Parameter: A = 1.0 B = 1.352-0.0286*T $\lambda_1$ = 299.75+0.0386*T



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

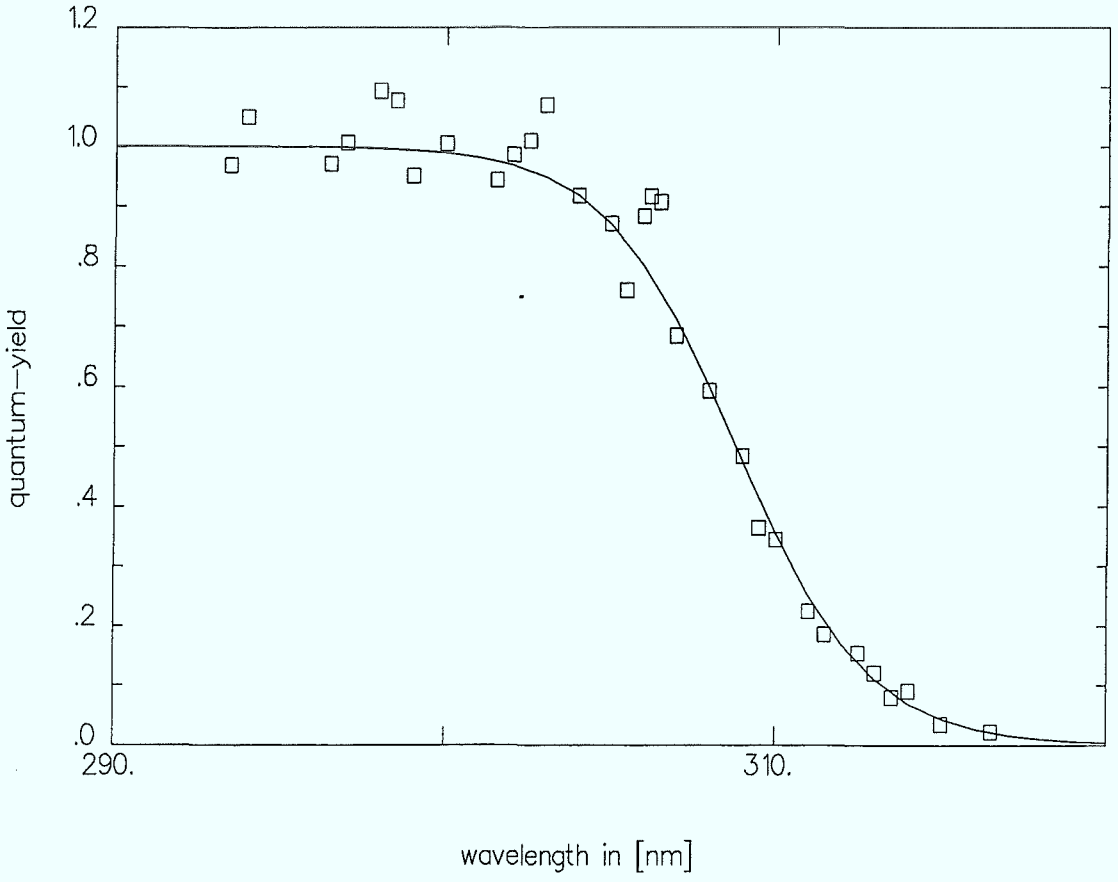
Reference:
Philen, D.L., R.T. Watson, and D.D. Davies, A Quantum Yield Determination of $O(^1D)$ Production from Ozone via Laser Flash Photolysis, J. Chem. Phys., **67** (1977), 3316-3321

Data: table Resolution: 0.5 - 1.5 nm

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 0.5 $\lambda_1$ = 308.8



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

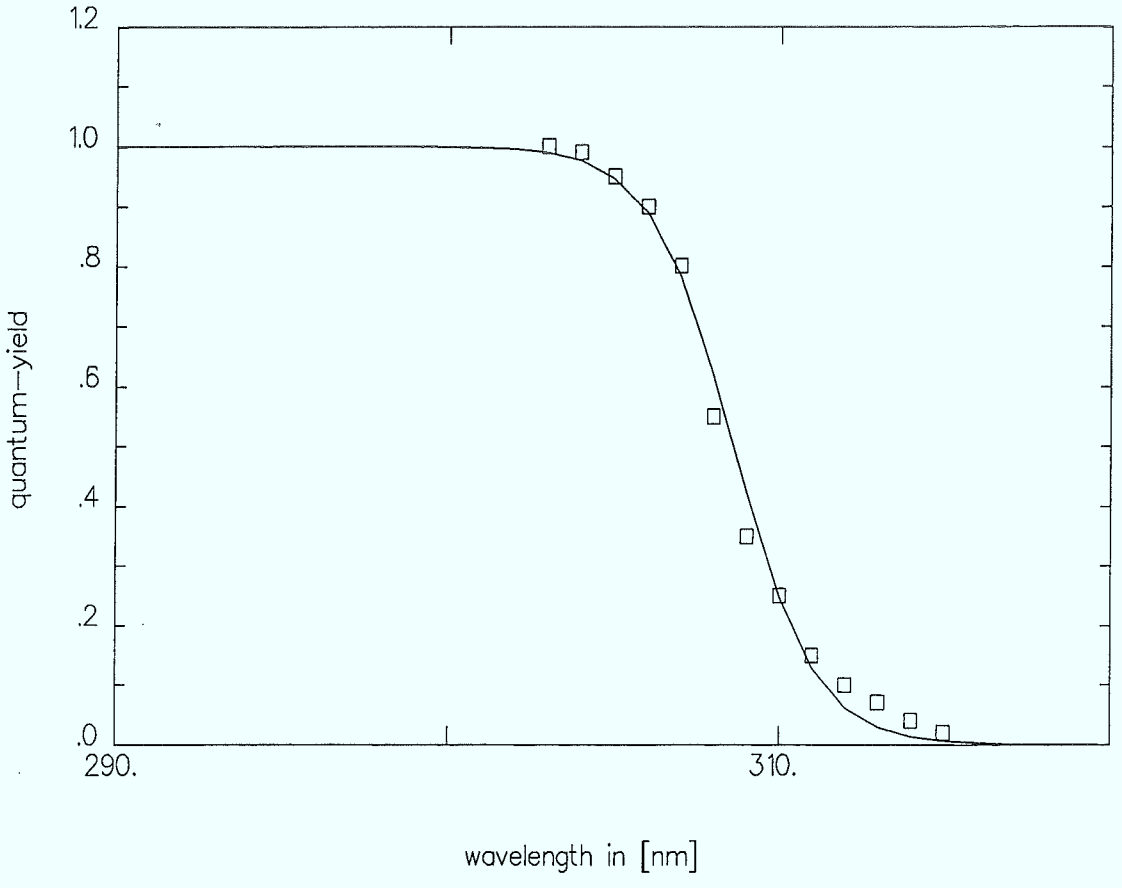
Reference:
NASA, Chlorofluoromethanes and the Stratosphere, NASA Reference Publication 1010 (1977), 31

Data: table Resolution: 1.0 nm

Temperature: 235. K

Function: 2

Fit Parameter: A = 1.0 B = 0.8 $\lambda_1$ = 308.6



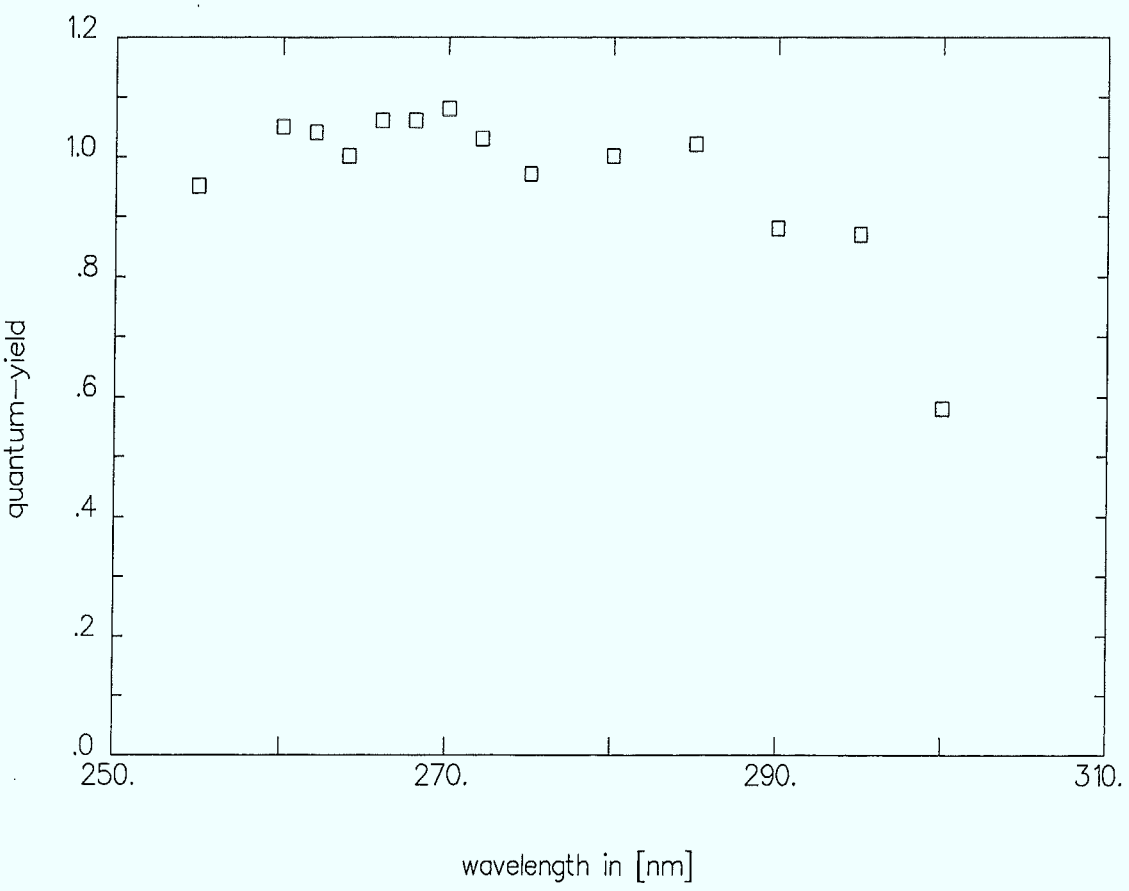
Photolysis: $O_3 \rightarrow O(^1D) + O_2$

Reference:
Fairchild, P.W., and E.K.C. Lee, Relative Quantum Yields of $O(^1D)$ in Ozone Photolysis in the Region Between 250 and 300 nm, Chem. Phys. Lett., **60** (1978), 36-39

Data: table Resolution: 5.0 nm

Temperature: 296. K

Function: not fitted



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

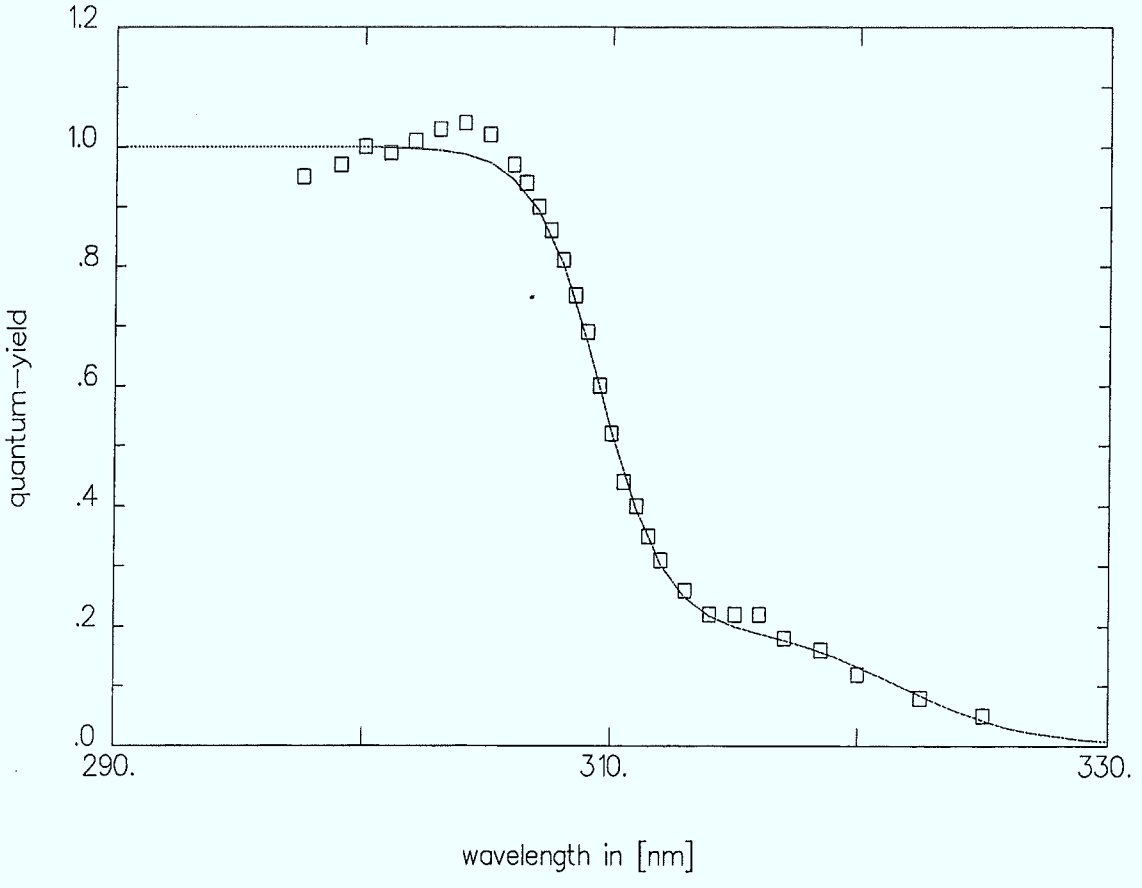
Reference:
Brock, J.C., and R.T. Watson, Laser Flash Photolysis of Ozone: $O(^1D)$ Quantum Yields in the Fall-Off Region 297-3256 nm, Chem. Phys., **46** (1980), 477-484

Data: table Resolution: 1.5 - 2.5 nm

Temperature: 298. K

Function: 7

Fit Parameter: A = 0.8 B = 0.75 $\lambda_1$ = 309.5
C = 0.2 D = 0.4 $\lambda_2$ = 321.7



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

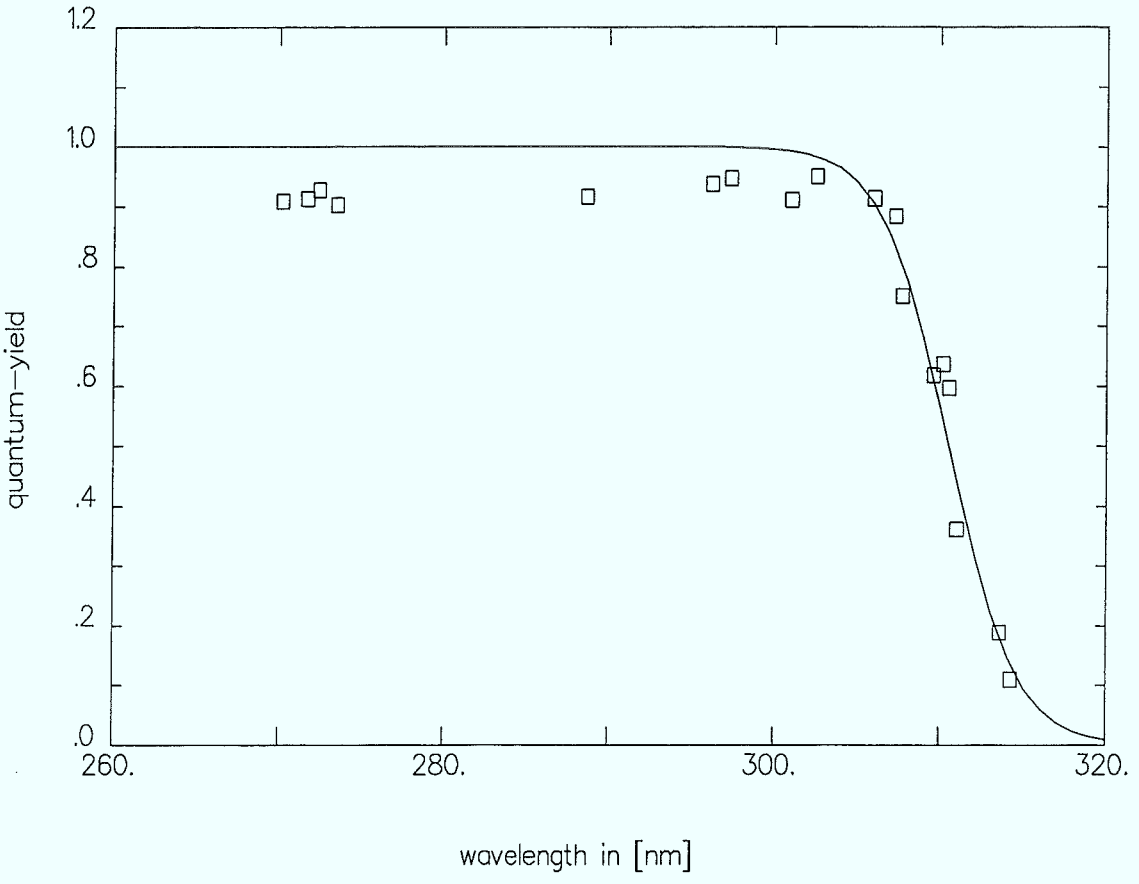
Reference:
Davenport, J.E., Parameters for Ozone Photolysis as a Function of Temperature at 280-330 nm, FAA-EE-80-44 R, 1982

Data: diagram

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 0.5 $\lambda_1$ = 310.5



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

Reference:
Trolier, M., and J.R. Wiesenfeld, Relative Quantum Yield of $O(^1D)$ Following Ozone Photolysis Between 275 and 325 nm, J. Geophys. Res., **93** (1988), 7119-7124

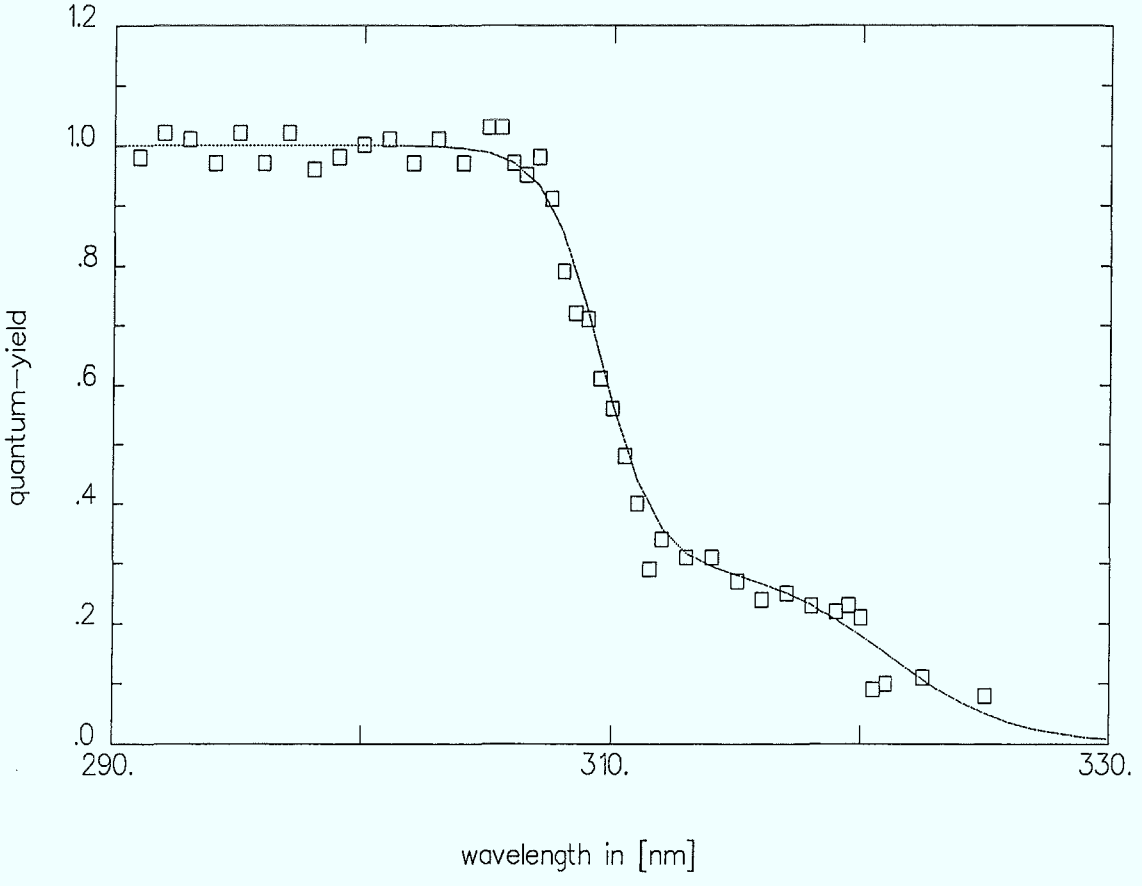
Data: table Resolution: 0.5 - 2.5 nm

Temperature: 298. K

Function: 7

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| A = | 0.7 | B = | 0.9 | $\lambda_1$ = | 309.5 |
| C = | 0.3 | D = | 0.4 | $\lambda_2$ = | 321.0 |



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

Reference:
Ball, S.M., G. Hancock, I.J. Murphy, and S.P. Rainer, The Relative Quantum Yields of $O_2(a^1\Delta_g)$ from the Photolysis of Ozone in the Wavelength Range $270nm < \lambda < 329nm$, Geophys. Res. Lett., **20** (1993), 2063-2066

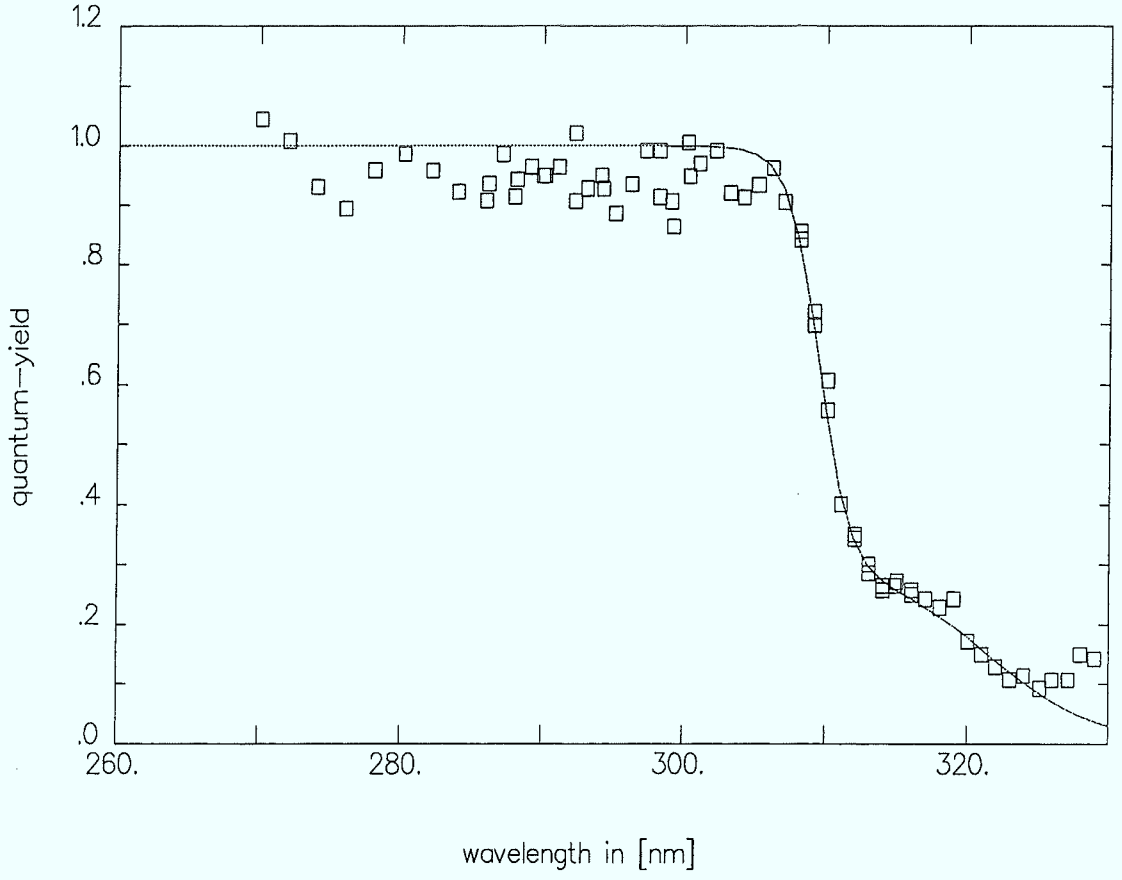
Data: diagram

Temperature: 298. K

Function: 7

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| A = | 0.7 | B = | 0.9 | $\lambda_1$ = | 309.5 |
| C = | 0.3 | D = | 0.26 | $\lambda_2$ = | 321.5 |



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

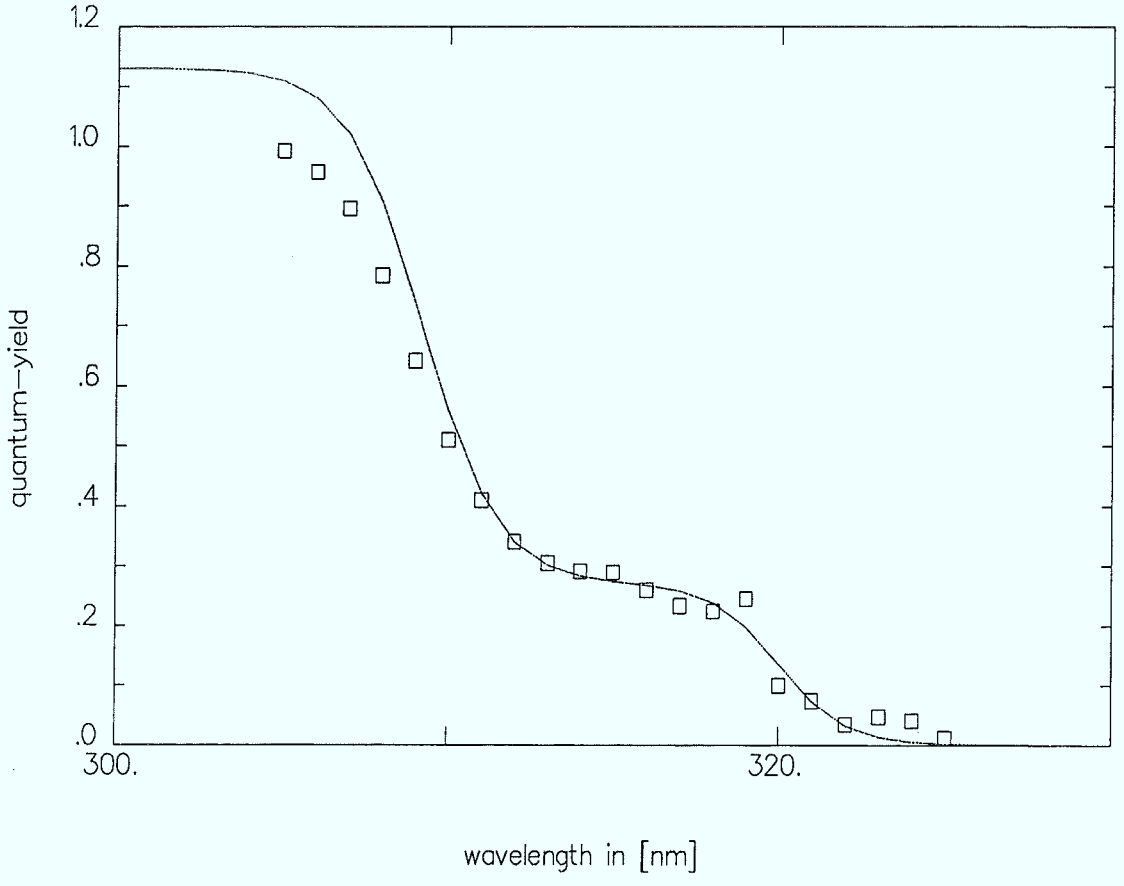
Reference:
Michelson, H.A., R.J. Salawitch, P.O. Wennberg, and J.G. Anderson, Production of $O(^1D)$ from Photolysis of $O_3$, Geophys. Res. Lett., **21** (1994), 2227-2230

Data: formula Resolution: 1.0 nm

Temperature: 298. K

Function: 7

Fit Parameter: A = 0.86 B = 0.865 $\lambda_1$ = 307.68+0.0051*T
C = -0.46+0.00245*T D = 1.0 $\lambda_2$ = 320.0



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

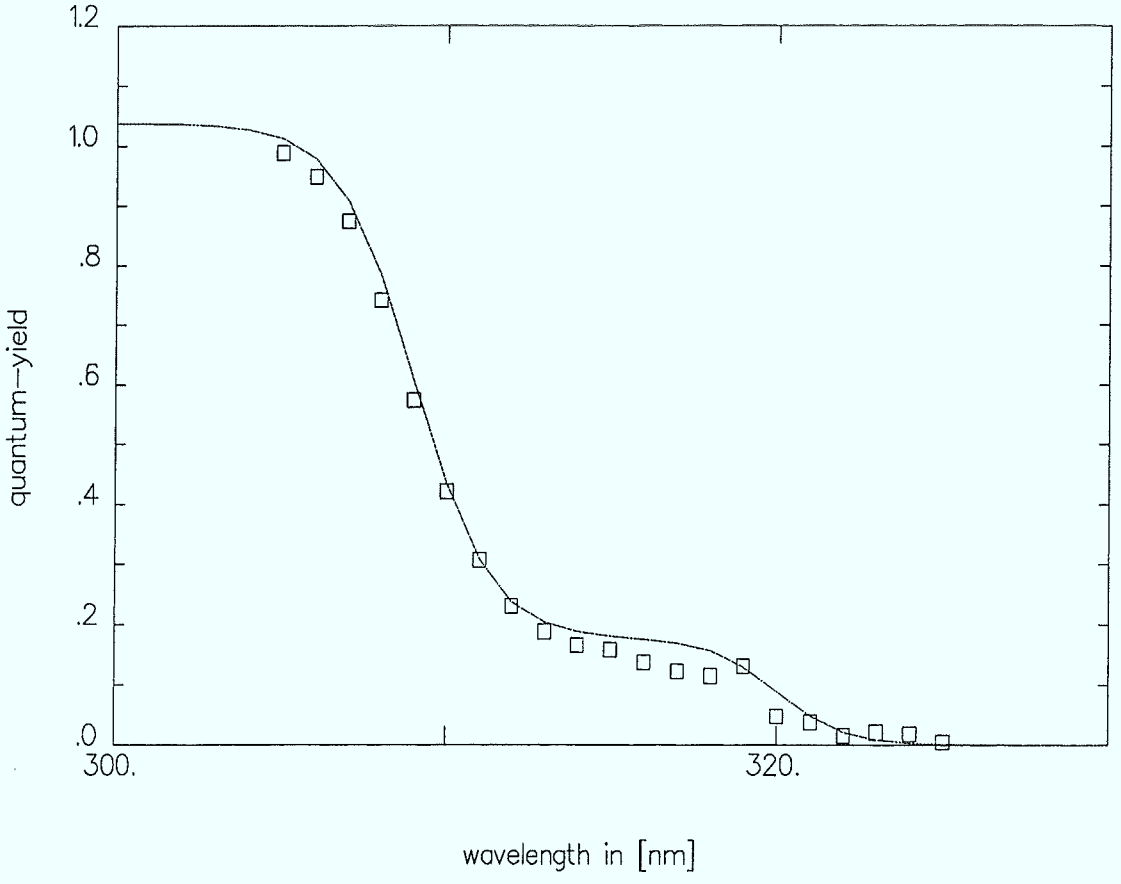
Reference:
Michelson, H.A., R.J. Salawitch, P.O. Wennberg, and J.G. Anderson, Production of $O(^1D)$ from Photolysis of $O_3$, Geophys. Res. Lett., **21** (1994), 2227-2230

Data: formula Resolution: 1.0 nm

Temperature: 260. K

Function: 7

Fit Parameter: A = 0.86 B = 0.865 $\lambda_1$ = 307.68+0.0051*T
C = -0.46+0.00245*T D = 1.0 $\lambda_2$ = 320.0



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

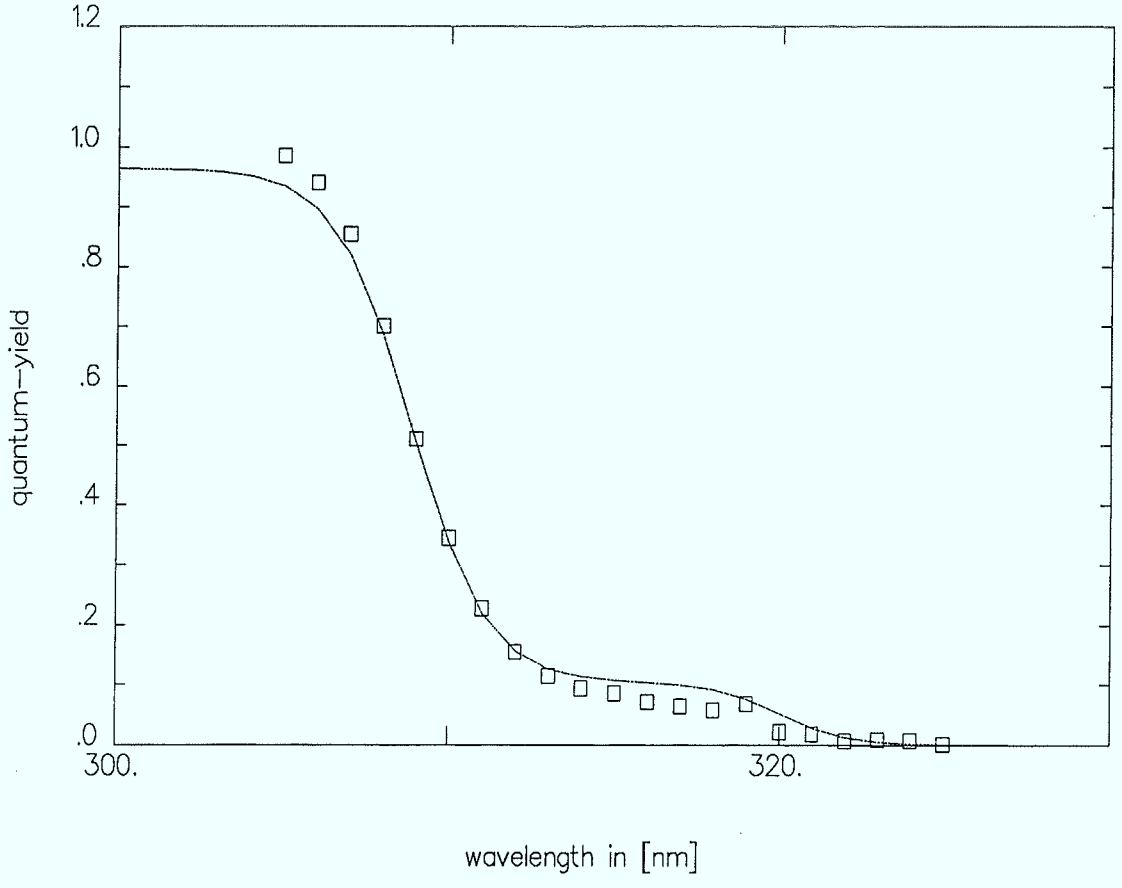
Reference:
Michelson, H.A., R.J. Salawitch, P.O. Wennberg, and J.G. Anderson, Production of $O(^1D)$ from Photolysis of $O_3$, Geophys. Res. Lett., **21** (1994), 2227-2230

Data: formula Resolution: 1.0 nm

Temperature: 230. K

Function: 7

Fit Parameter: A = 0.86 B = 0.865 $\lambda_1$ = 307.68+0.0051*T
C = -0.46+0.00245*T D = 1.0 $\lambda_2$ = 320.0



Photolysis: $O_3 \rightarrow O(^1D) + O_2$

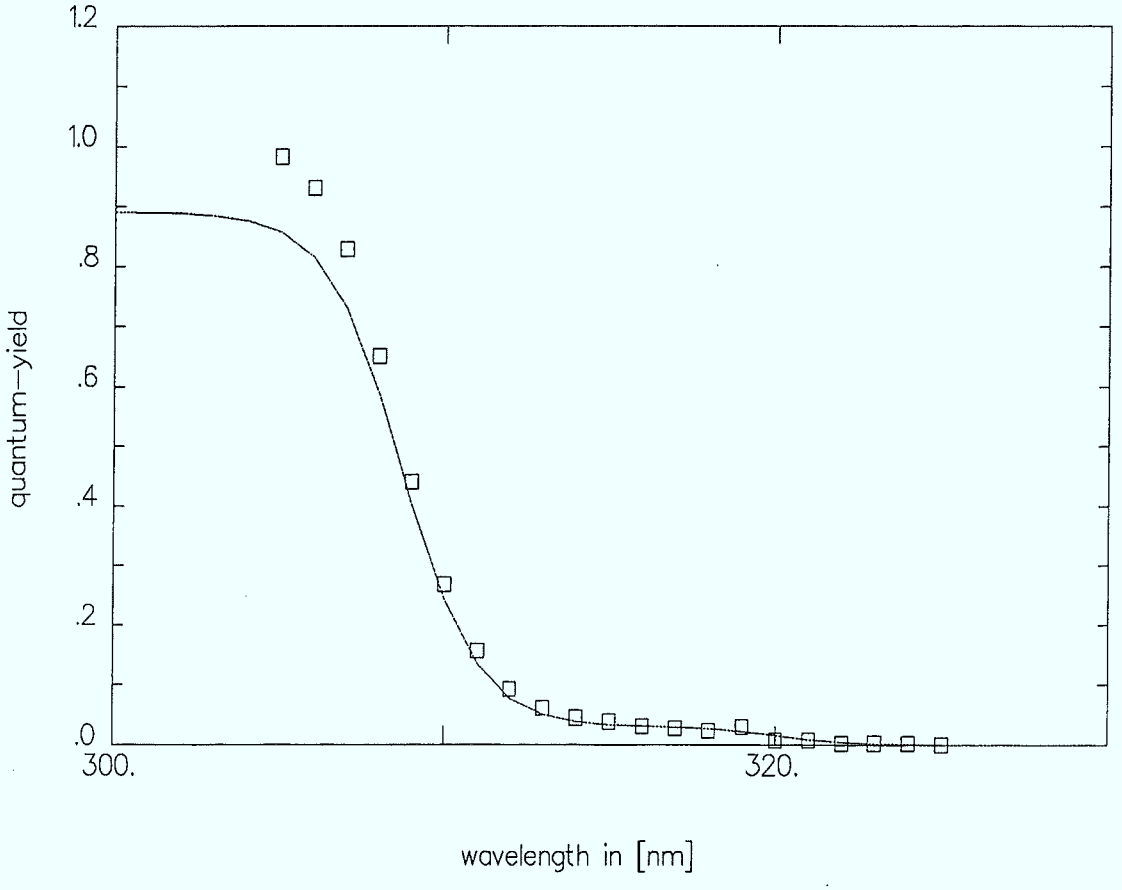
Reference:
Michelson, H.A., R.J. Salawitch, P.O. Wennberg, and J.G. Anderson, Production of $O(^1D)$ from Photolysis of $O_3$, Geophys. Res. Lett., **21** (1994), 2227-2230

Data: formula Resolution: 1.0 nm

Temperature: 200. K

Function: 7

Fit Parameter: A = 0.86 B = 0.865 $\lambda_1$ = 307.68+0.0051*T
C = -0.46+0.00245*T D = 1.0 $\lambda_2$ = 320.0



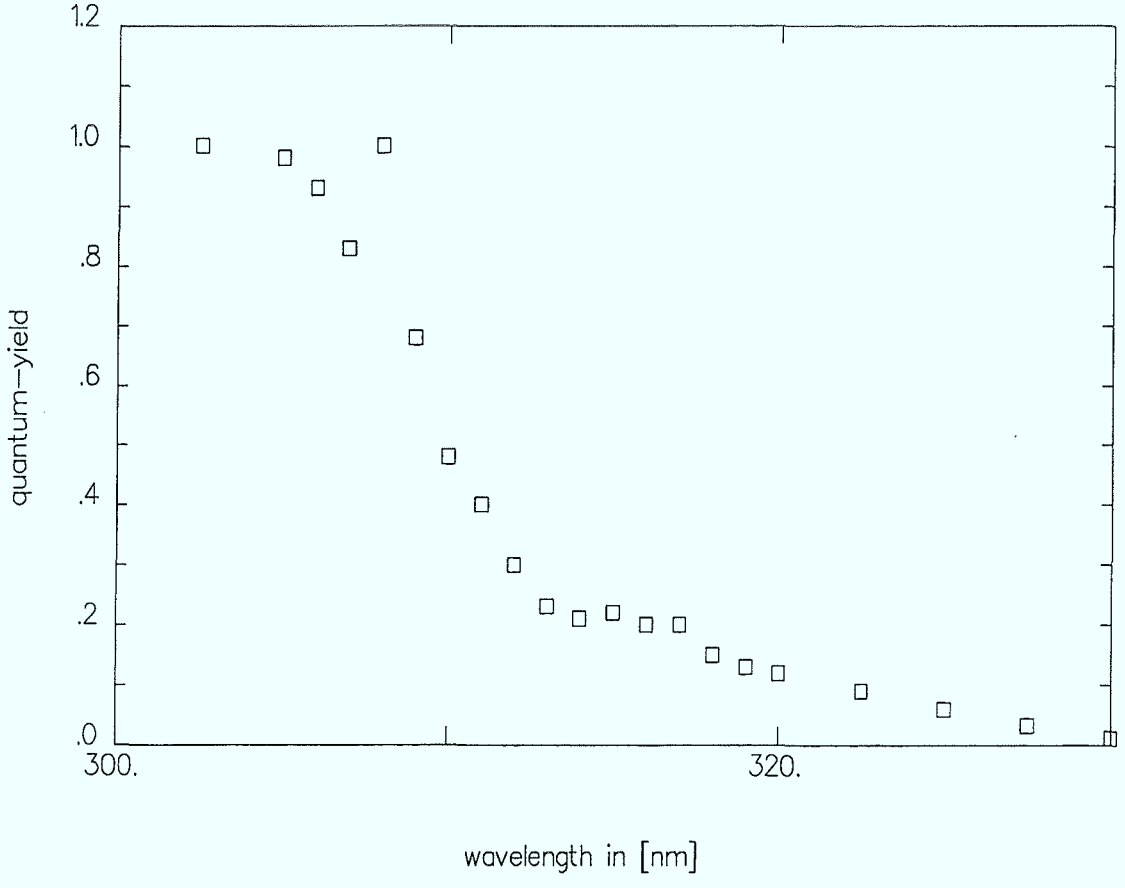
Photolysis: $O_3 \rightarrow O(^1D) + O_2$

Reference:
Armerding, W., F.J. Comes, and B. Schülke, $O(^1D)$-Quantum Yields of Ozone Photolysis in the UV from 300 nm to Its Threshold and at 355 nm, J. Phys. Chem., **99** (1995), 3137-3143.

Data: table Resolution: 1.0 / 2.5 nm

Temperature: 298. K

Function: not fitted



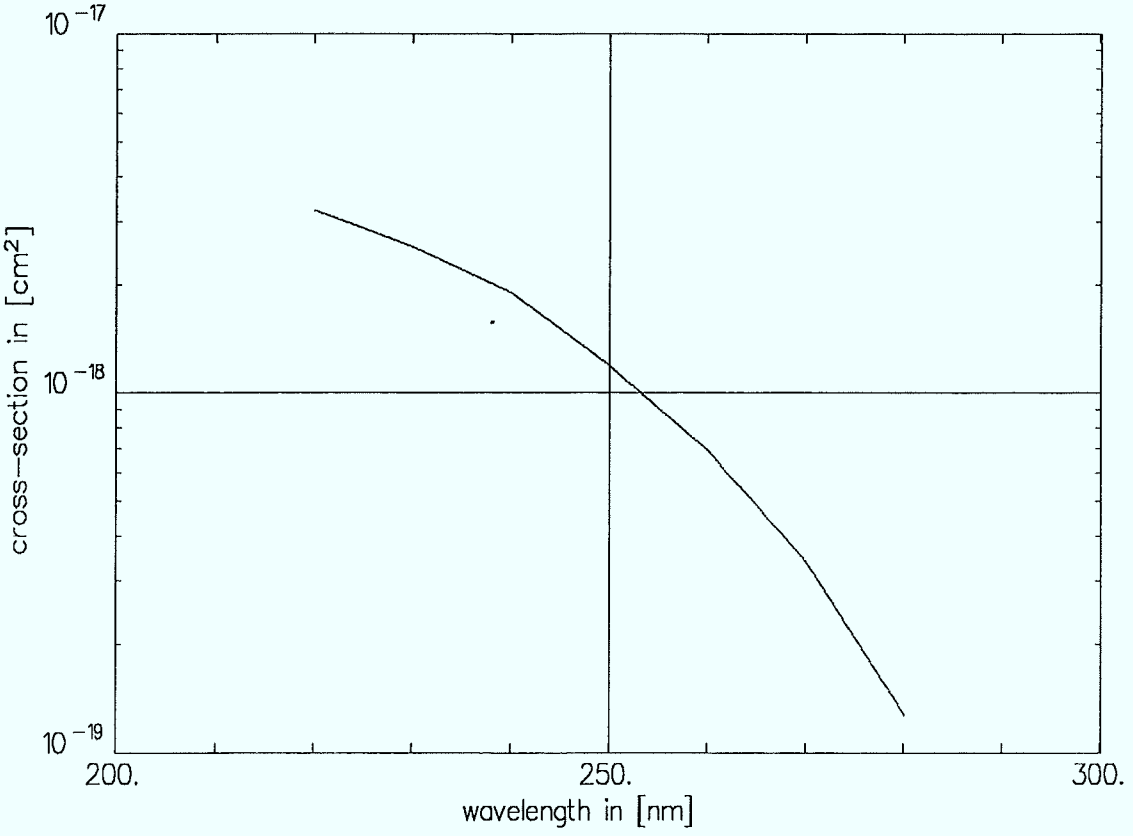
Substance: $HO_2$

Reference:
Kijewski, H., and J. Troe, Study of the Pyrolysis of $H_2O_2$ in the Presence of $H_2$ and CO by Use of UV Absorption of $HO_2$, Int.J. Chem. Kin., **3** (1971), 223-235

Data: diagram

Temperature: 1000. K

Temperature dependence: no



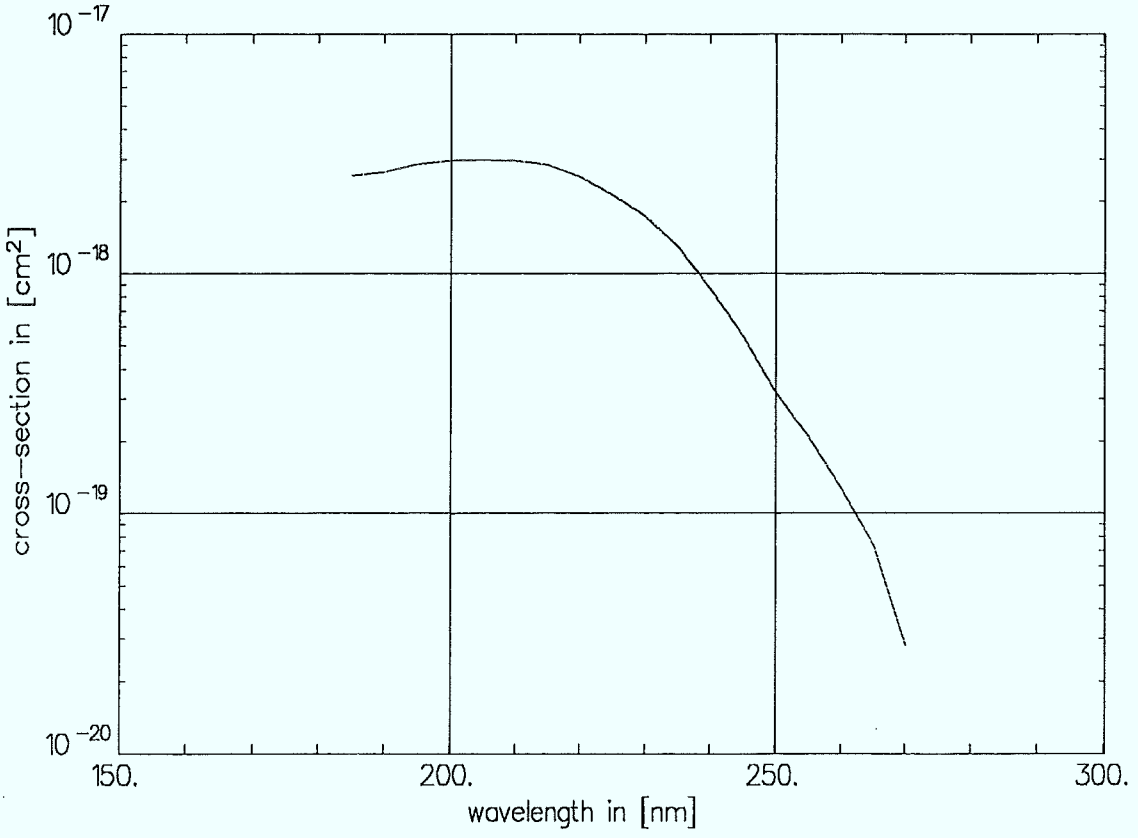
Substance: $HO_2$

Reference:
Hochanadel, C.J., J.A. Ghormley, and P.J. Ogren, Absorption Spectrum and Reaction Kinetics of the $HO_2$ Radical in the Gas Phase, J. Chem. Phys., **56** (1972), 4426-4432

Data: diagram

Temperature: 298. K

Temperature dependence: no



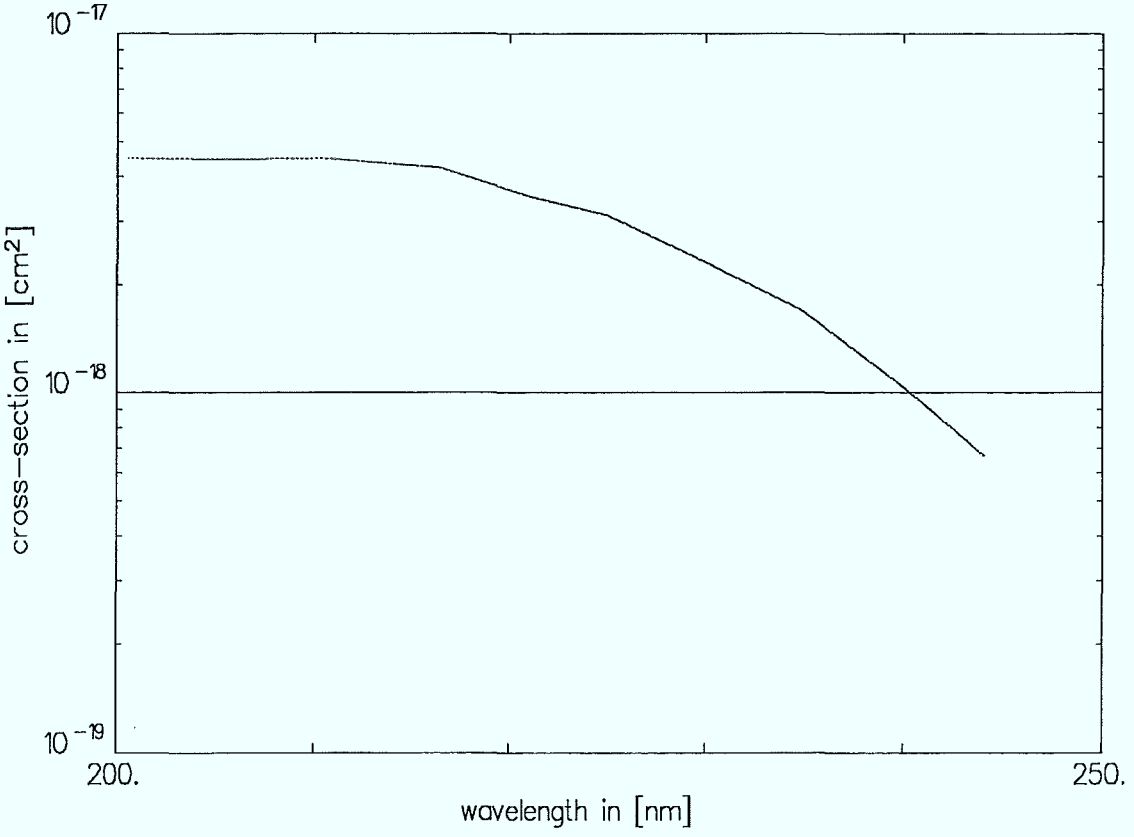
Substance: $HO_2$

Reference:
Paukert, T.T., and H.S. Johnston, Spectra and Kinetics of the Hydroxylperoxyl Free Radical in the Gas Phase, J. Chem. Phys., **56** (1972), 2824-2838

Data: diagram

Temperature: 298. K

Temperature dependence: no



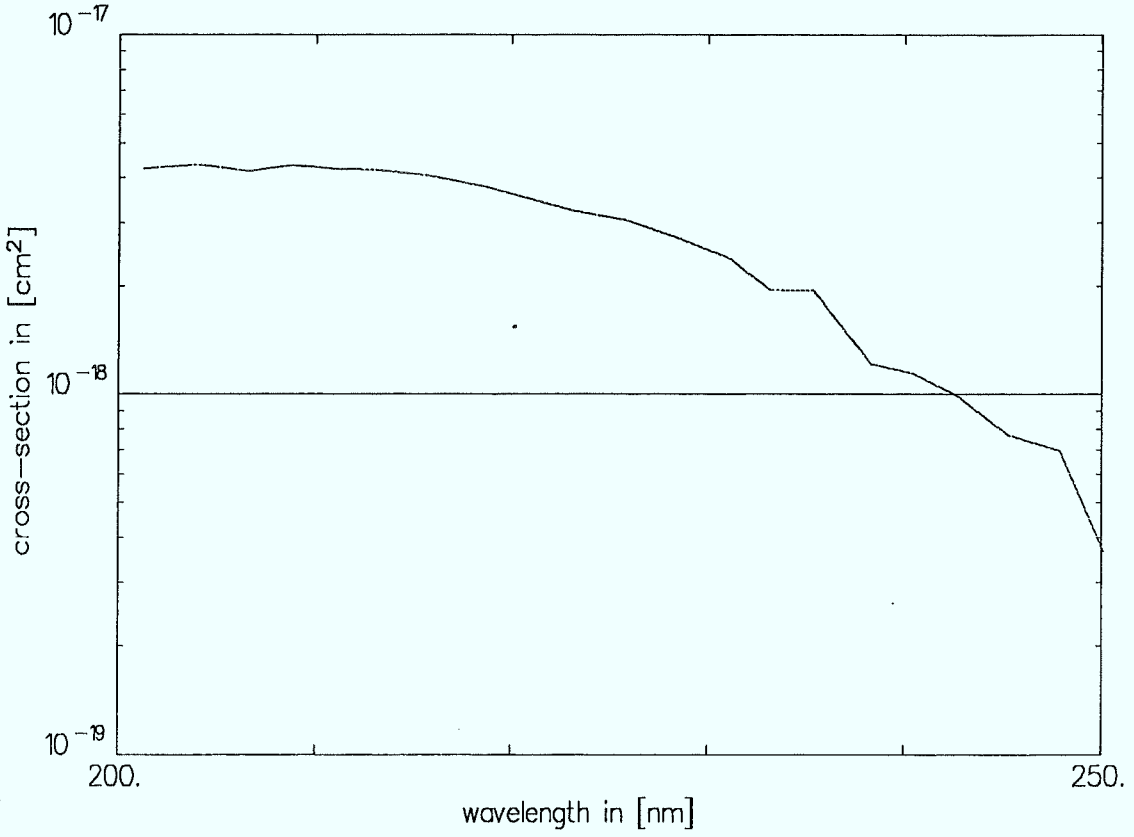
Substance: $HO_2$

Reference:
Cox, R.A., and J.P. Burrows, Kinetics and Mechanism of the Disproportionation of $HO_2$ in the Gas Phase, J. Phys. Chem., **83** (1979), 2560-2568

Data: diagram

Temperature: 298. K

Temperature dependence: no



Substance: $HO_2$

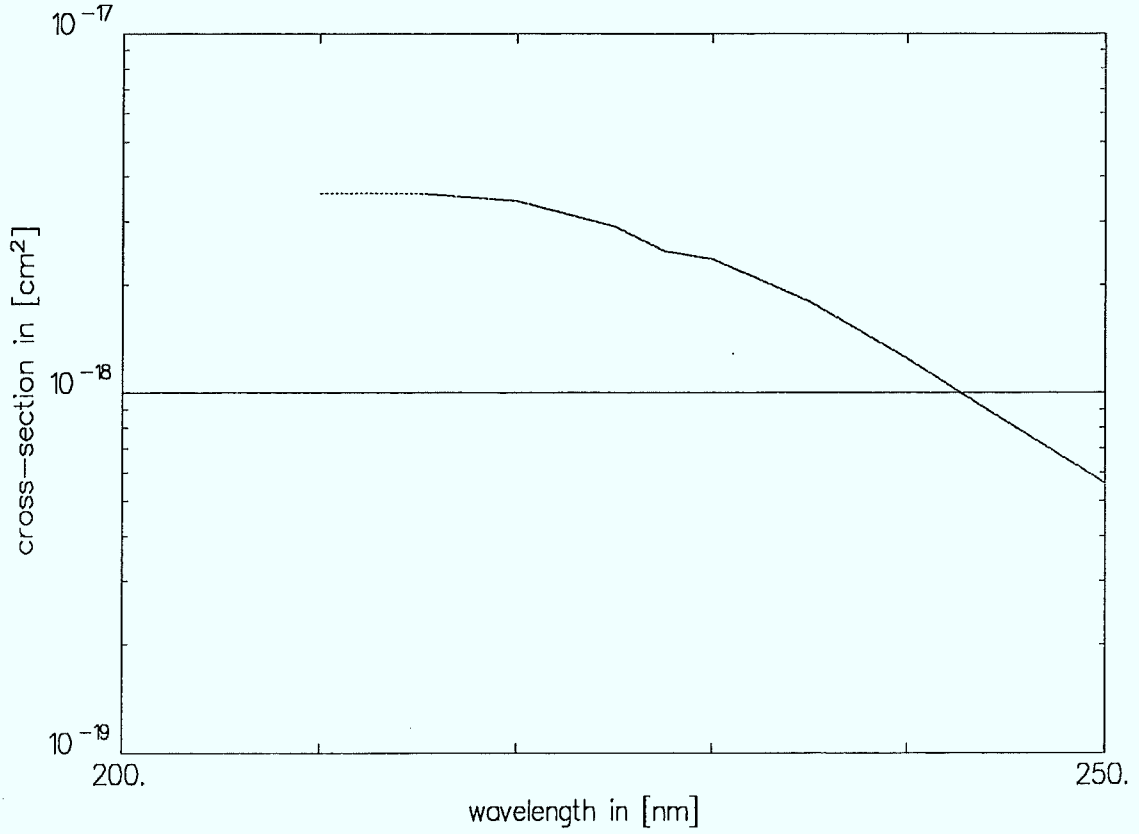
Reference:
Kurylo, M.J., T.J. Wallington, and P.A., Ouellette, Measurements of the UV Absorption Cross-Sections for $HO_2$ and $CH_3O_2$ in the Gas Phase, J. Photochem., **39** (1987), 201-215

Data: table Resolution: 2.5 - 10.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: $HO_2$ was generated by the flash photolysis of a $Cl_2/CH_3OH/O_2$ mixture



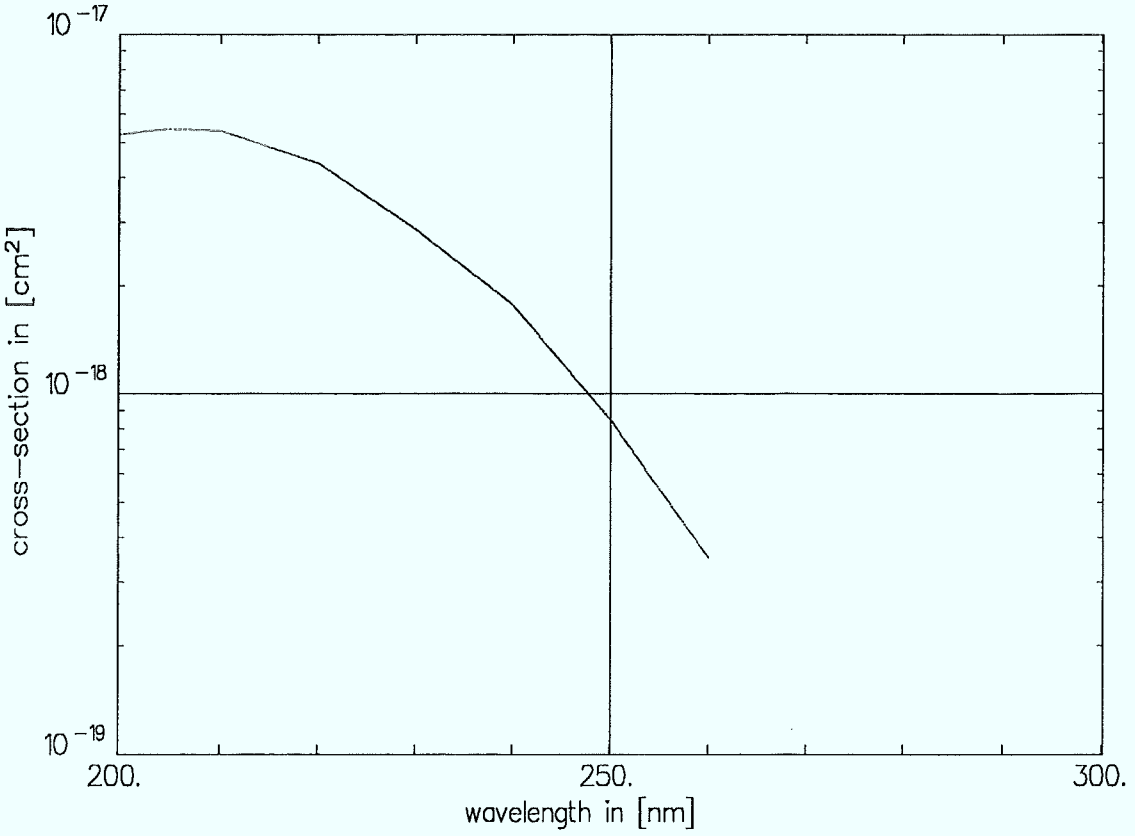
Substance: $HO_2$

Reference:
McAdam, K., B. Veyret, and R. Lesclaux, UV Absorption Spectra of $HO_2$ and $CH_3O_2$ Radicals and Their Kinetics of Their Mutual Reactions at 298 K, Chem. Kin. Lett., **133** (1987), 39-44

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: $HO_2$

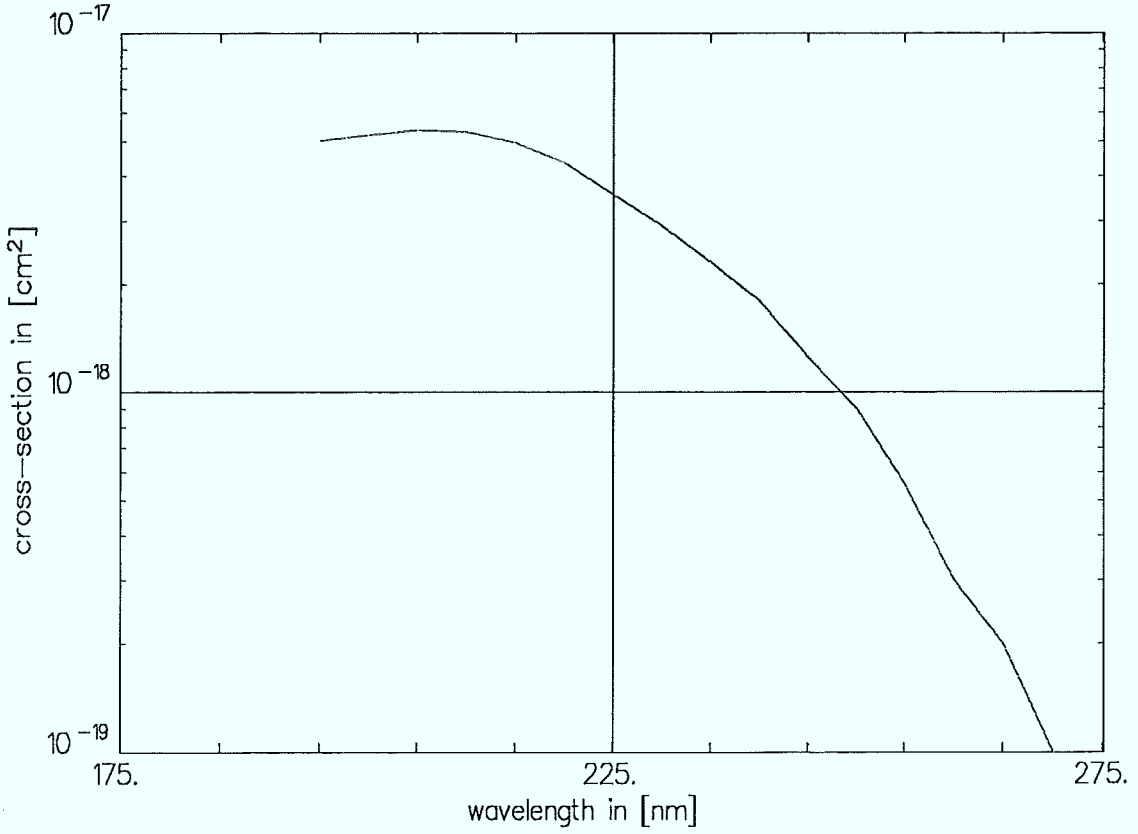
Reference:
Moortgat, G.K., B. Veyret, and R. Lesclaux, Absorption Spectrum and Kinetics of Reactions of the Acetylperoxy Radical, J. Phys. Chem., **93** (1989), 2362-2368

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no

Comments: No temperature dependence was observed.
The radical was generated by flash photolysis of $Cl_2/CH_3OH/O_2$ mixtures.



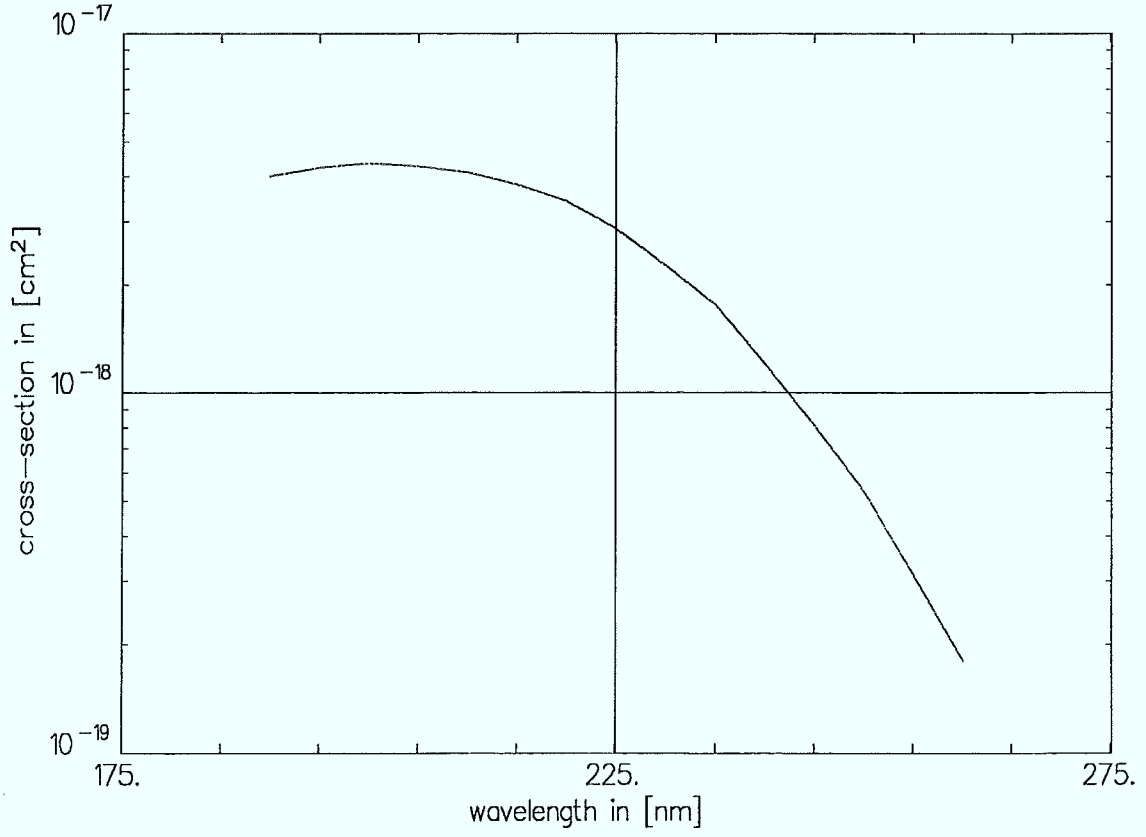
Substance: $HO_2$

Reference:
Crowley, J.N., F.G. Simon, J.P. Burrows, and G.K. Moortgat, in: Crowley, J.N., F.G. Simon, J.P. Burrows, G.K. Moortgat, Jenkin, M.E., and R.A. Cox, The $HO_2$ Radical UV Absorption Spectrum Measured by Molecular Modulation, UV/Diode-Array Spectroscopy, J. Photochem. Photobiol., **60** (1991), 1-10

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



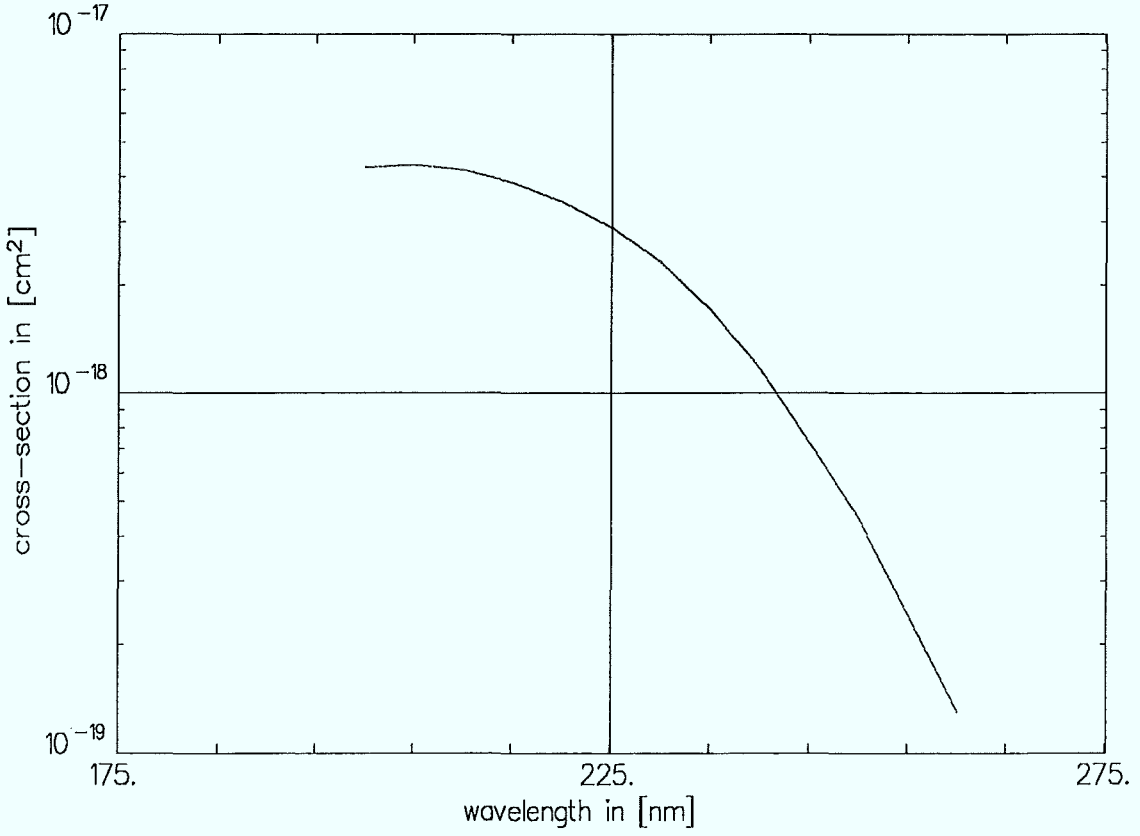
Substance: $HO_2$

Reference:
Jenkin, M.E., and R.A. Cox, in: Crowley, J.N., F.G. Simon, J.P. Burrows, G.K. Moortgat, Jenkin, M.E., and R.A. Cox, The $HO_2$ Radical UV Absorption Spectrum Measured by Molecular Modulation, UV/Diode-Array Spectroscopy, J. Photochem. Photobiol., **60** (1991), 1-10

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



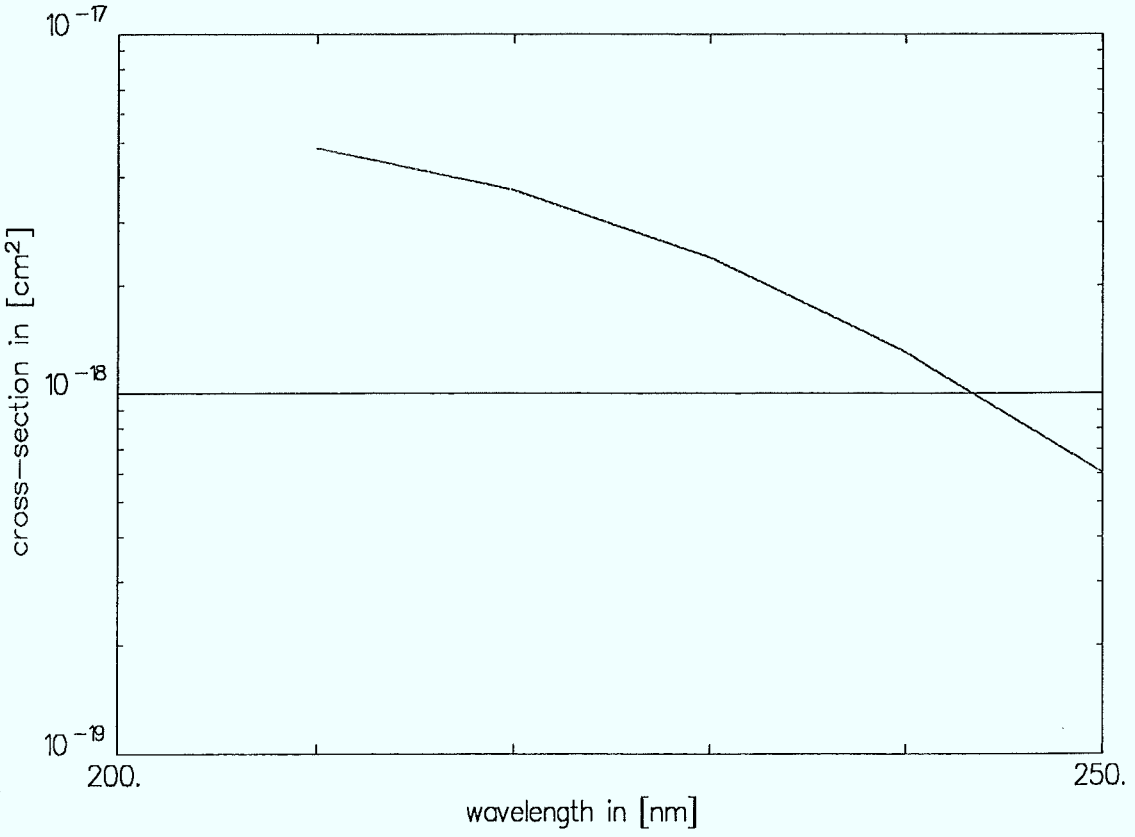
Substance: $HO_2$

Reference:
Lightfoot, P.D., and A.A. Jemi-Alade, The Temperature Dependence of the UV Spectra of the $HO_2$ and $CH_3O_2$ Radicals, J. Photochem. Photobiol., **59** (1991), 1-10

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



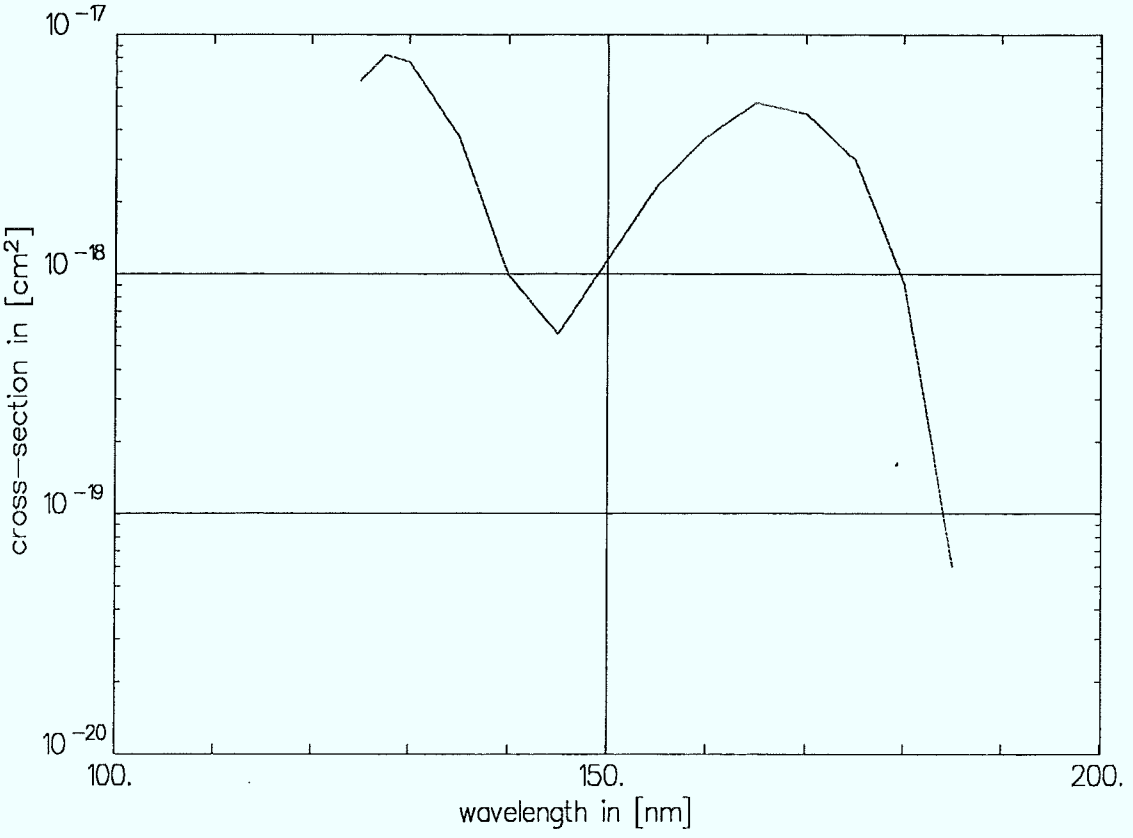
Substance: $H_2O$

Reference:
Watanabe, K., and M. Zelikoff, Absorption Coefficients of Water Vapor in the Vacuum Ultraviolet, J. Opt. Soc. Am., **43** (1953), 753-755

Data: diagram

Temperature: 298. K

Temperature dependence: no



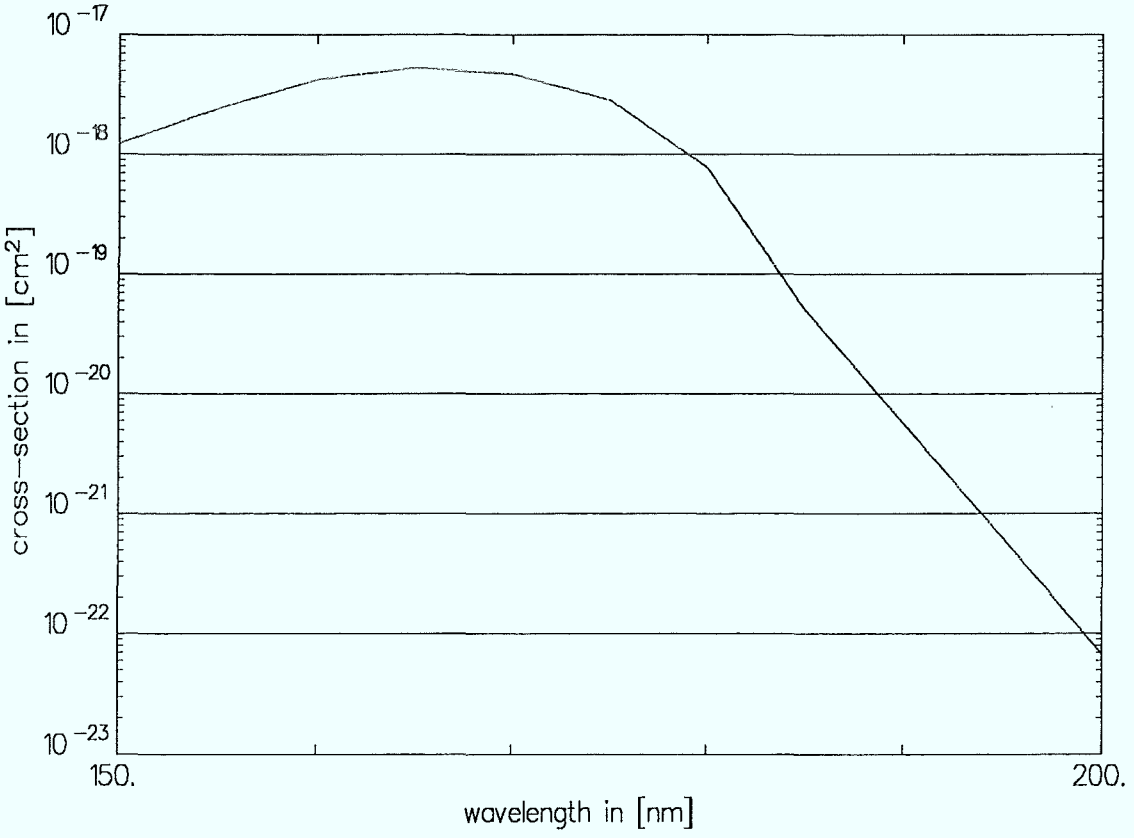
Substance: $H_2O$

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



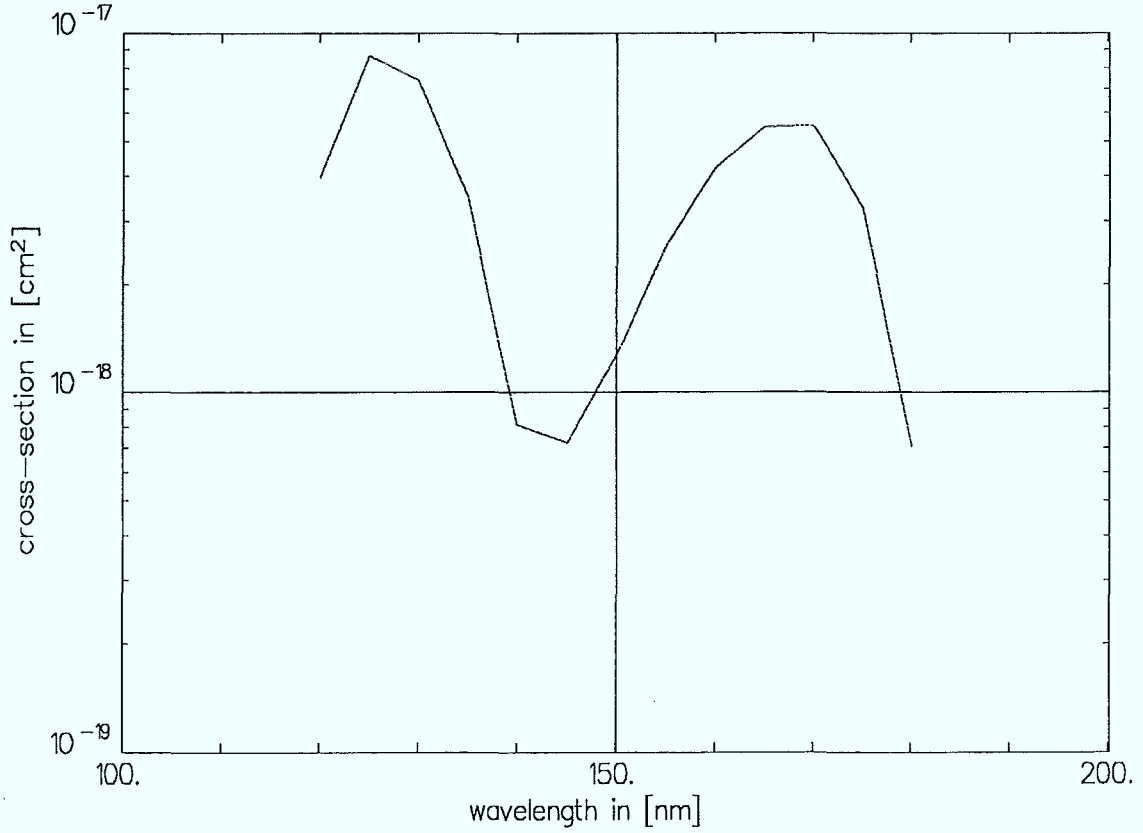
Substance: $H_2O$

Reference:
Schürgers, M., and K.H. Welge, Absorptionskoeffizient von $H_2O_2$ und $N_2H_4$ zwischen 1200 und 2000 A, Z. Naturforsch., **23 a** (1968), 1508-1510

Data: diagram

Temperature: 298. K

Temperature dependence: no



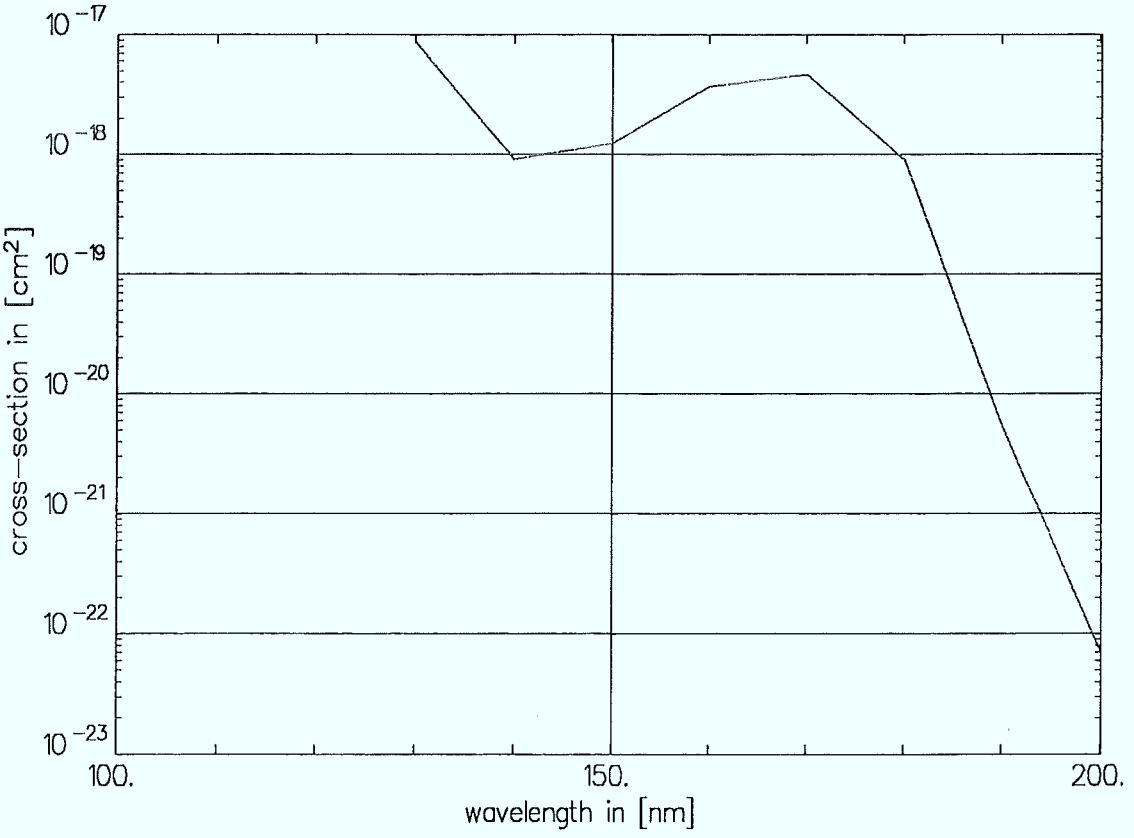
Substance: $H_2O$

Reference:
Hochanadel, C.J., J.A. Ghormley, and P.J. Ogren, Absorption Spectrum and Reaction Kinetics of the $HO_2$ Radical in the Gas Phase, J. Chem. Phys., **56** (1972), 4426-4432

Data: diagram

Temperature: 298. K

Temperature dependence: no



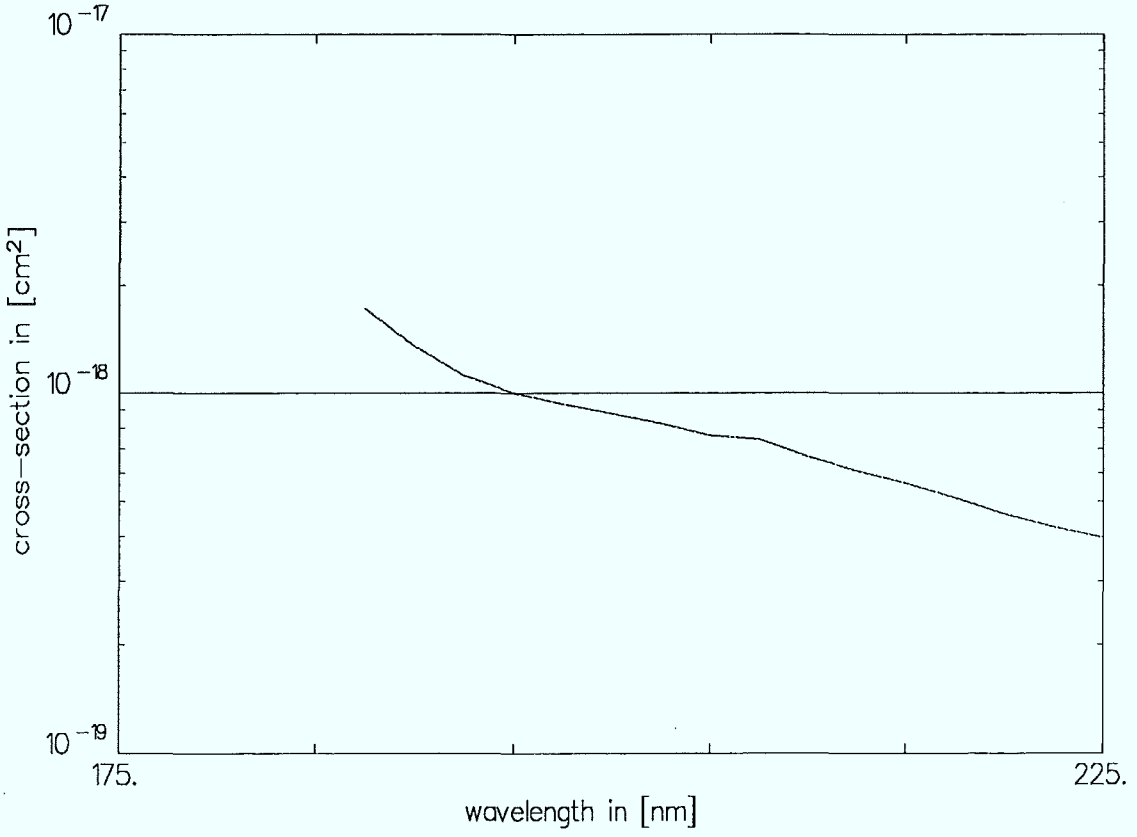
Substance: $H_2O_2$

Reference:
Holt, R.B., C.K. McLane, and O. Oldenberg, Ultraviolet Absorption Spectrum of Hydrogen Peroxide, J. Chem. Phys., **16** (1948), 225-229

Data: diagram

Temperature: 298. K

Temperature dependence: no



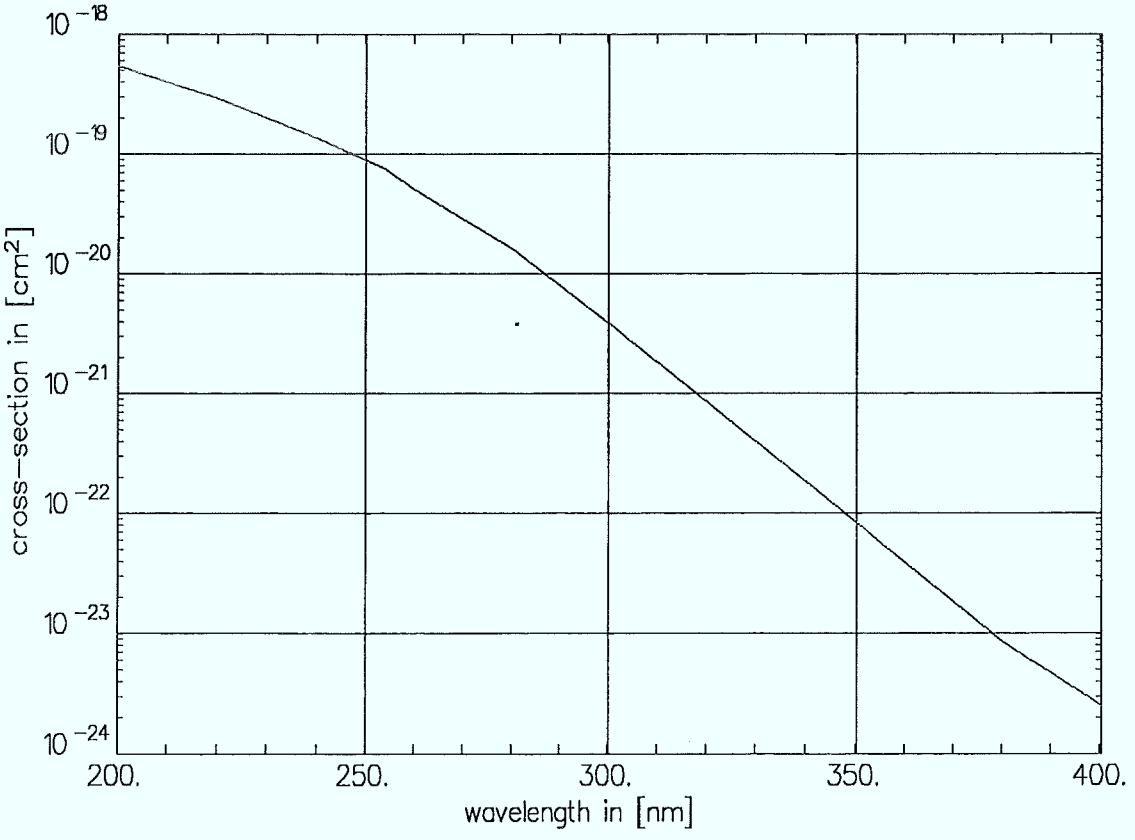
Substance: $H_2O_2$

Reference:
Schumb, W.C., C.N. Satterfield, and R.L. Wentworth, *Hydrogen Peroxide*, Reinhold Publishing Corporation, New York, 1955, p. 291

Data: table Resolution: 6.3 - 20.0 nm

Temperature: 298. K

Temperature dependence: no



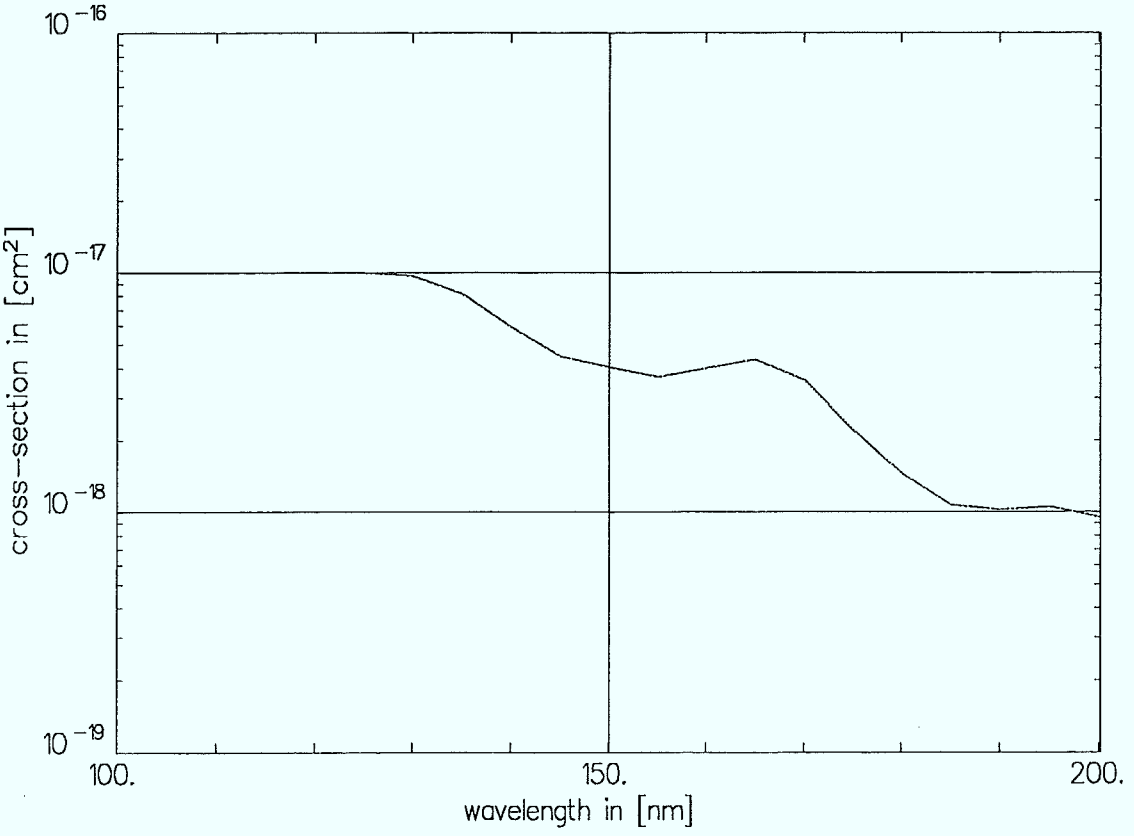
Substance: $H_2O_2$

Reference:
Schürgers, M., and K.H. Welge, Absorptionskoeffizient von $H_2O_2$ und $N_2H_4$ zwischen 1200 und 2000 A, Z. Naturforsch., **23 a** (1968), 1508-1510

Data: diagram

Temperature: 298. K

Temperature dependence: no



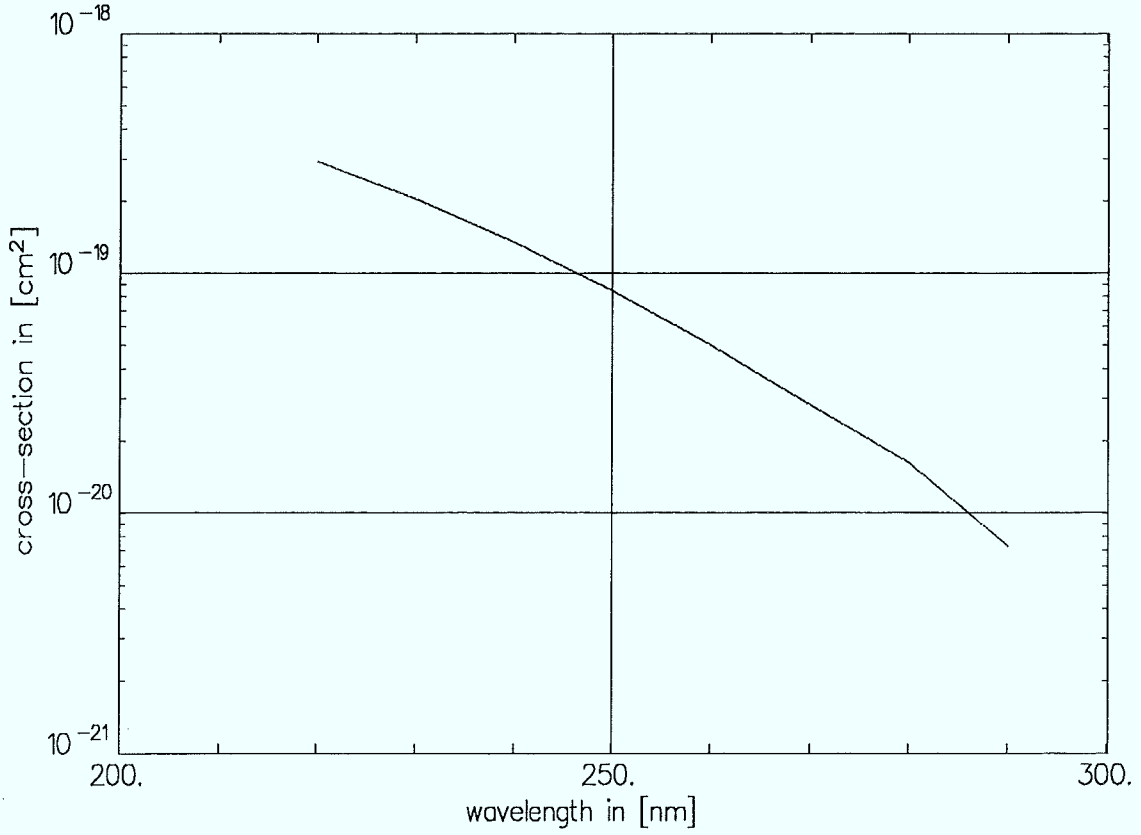
Substance: $H_2O_2$

Reference:
Troe, J., Ultraviolettspektrum und Reaktionen des $HO_2$-Radicals im thermischen Zerfall von $H_2O_2$, Ber. Bunsenges., **73** (1969), 946-952

Data: table Resolution: 10.0 nm

Temperature: 300. K

Temperature dependence: no



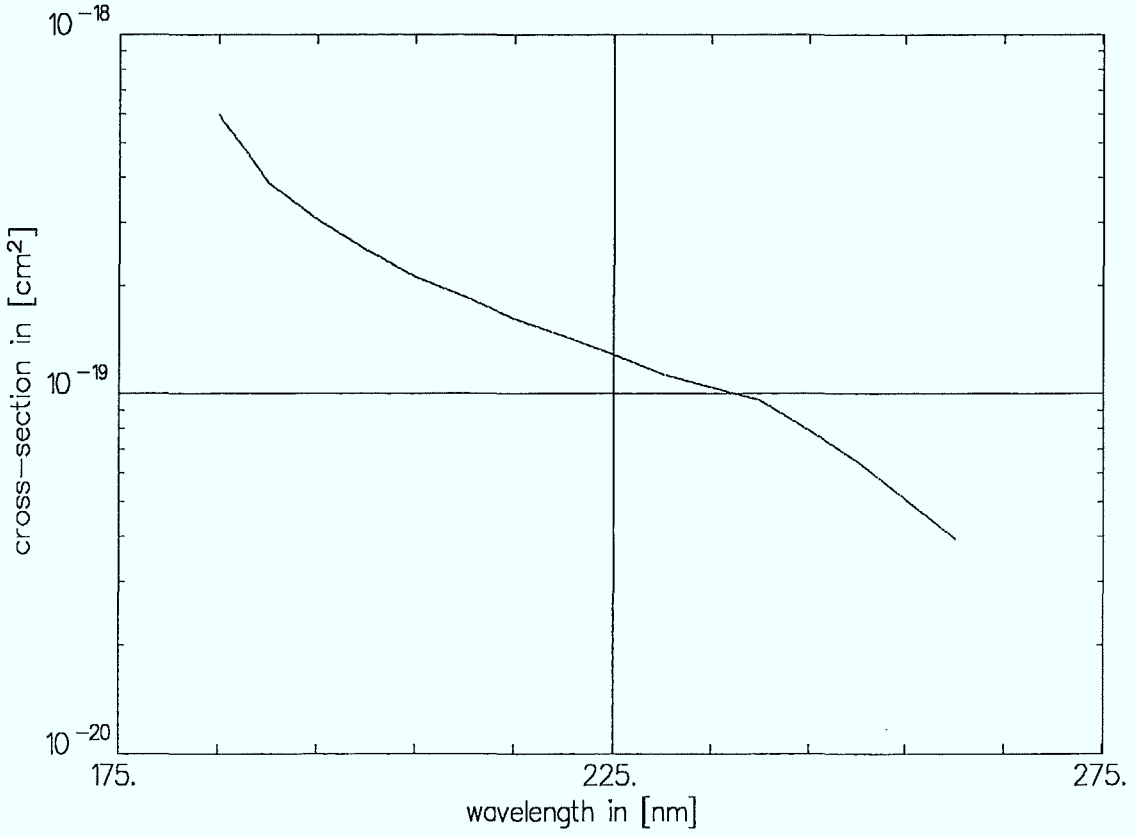
Substance: $H_2O_2$

Reference:
Hochanadel, C.J., J.A. Ghormley, and P.J. Ogren, Absorption Spectrum and Reaction Kinetics of the $HO_2$ Radical in the Gas Phase, J. Chem. Phys., **56** (1972), 4426-4432

Data: diagram

Temperature: 298. K

Temperature dependence: no



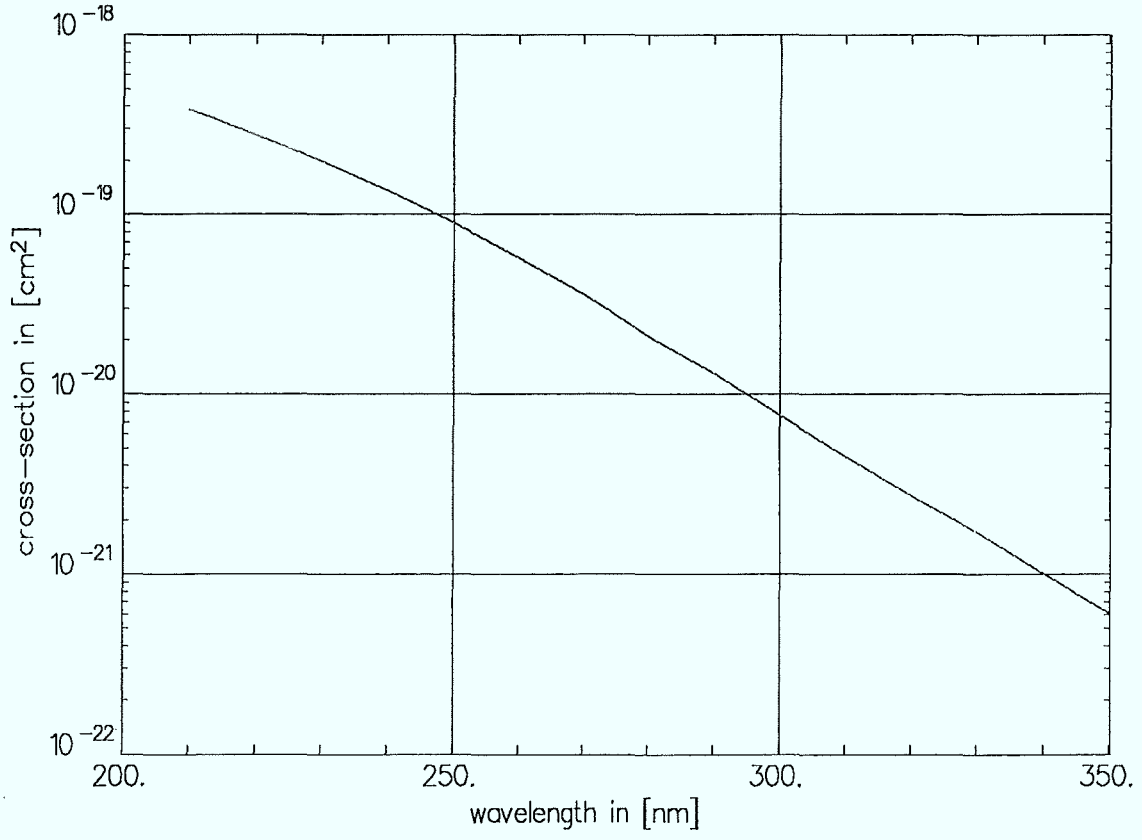
Substance: $H_2O_2$

Reference:
Molina, L.T., S.D. Schinke, and M.J. Molina, Ultraviolet Absorption Spectrum of Hydrogen Peroxide Vapor, Geophys. Res. Lett., **4** (1977), 580-582

Data: table Resolution: 10.0 nm

Temperature: 296. K

Temperature dependence: no



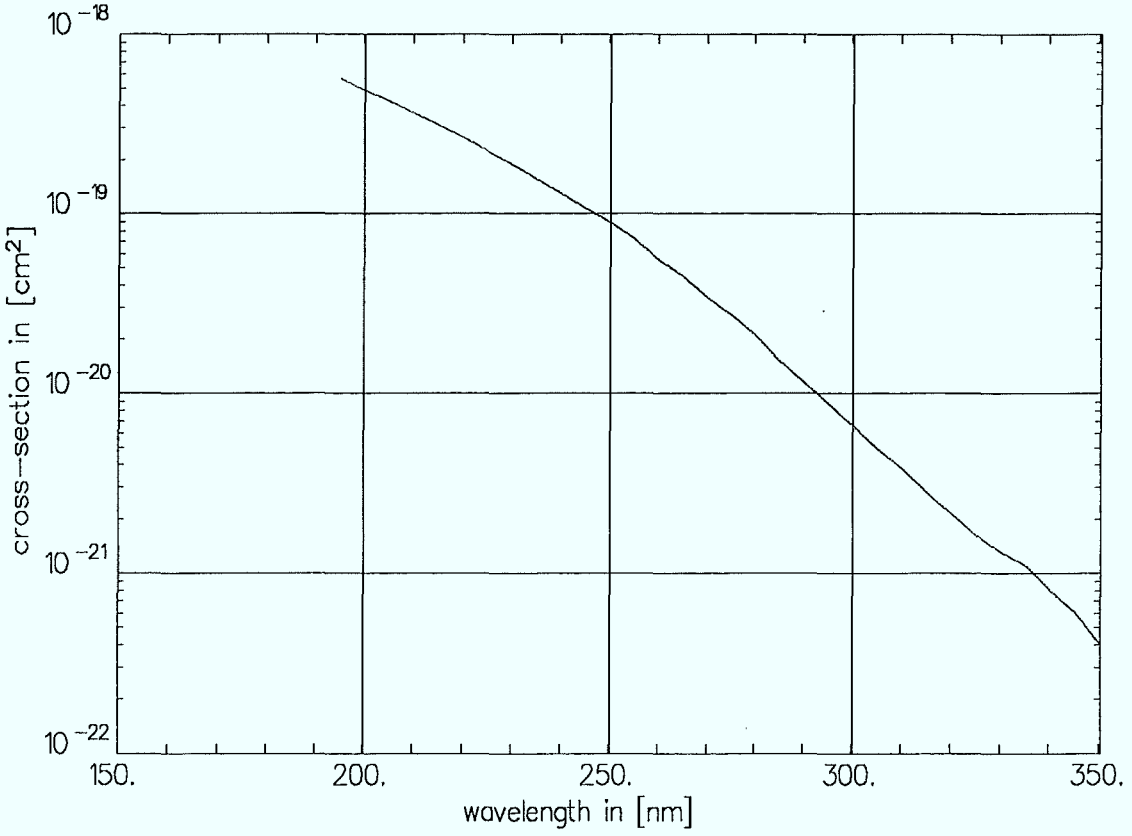
Substance: $H_2O_2$

Reference:
Lin, C.L., N.K. Rohatgi, and W.B. DeMore, Ultraviolet Absorption Cross Sections Hydrogen Peroxide, Geophys. Res. Lett., **5** (1978), 113-115

Data: table Resolution: 5.0 nm

Temperature: 296. K

Temperature dependence: no



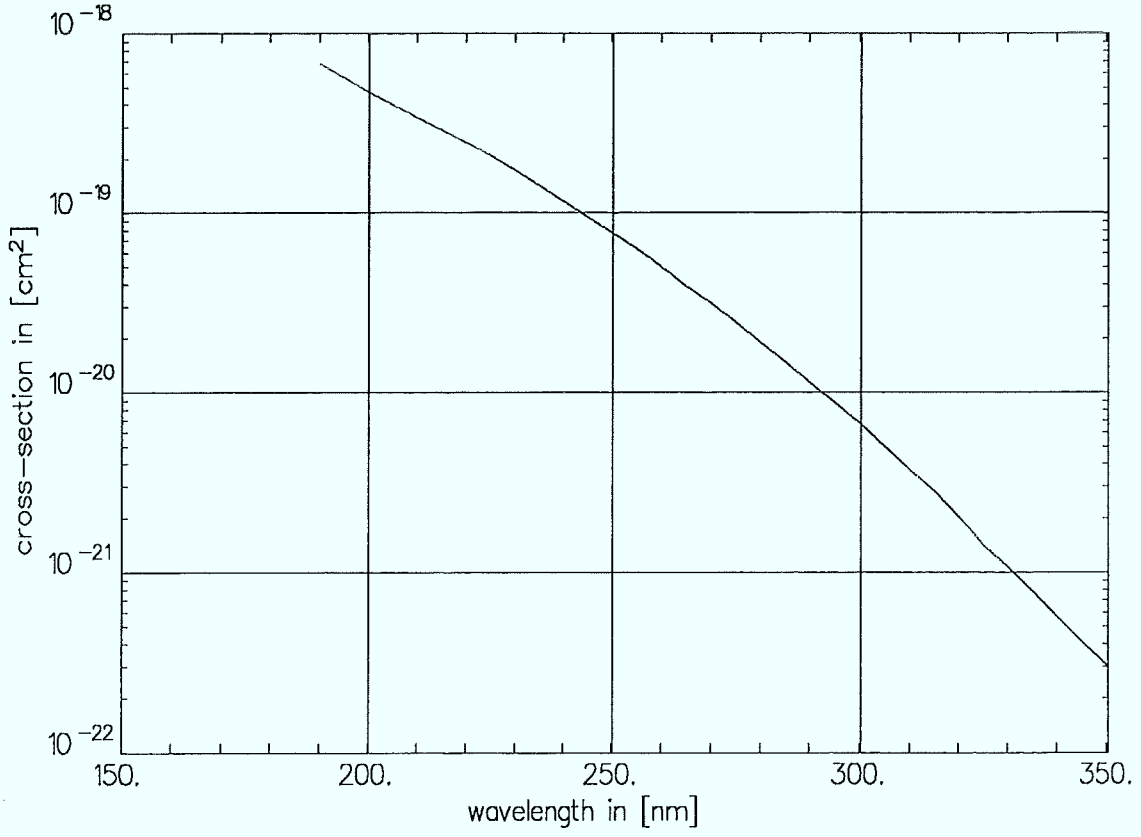
Substance: $H_2O_2$

Reference:
Molina, L.T., and M.J. Molina, UV Absorption Cross Sections of $HO_2NO_2$ Vapor, J. Photochem., **15** (1981), 97-108

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



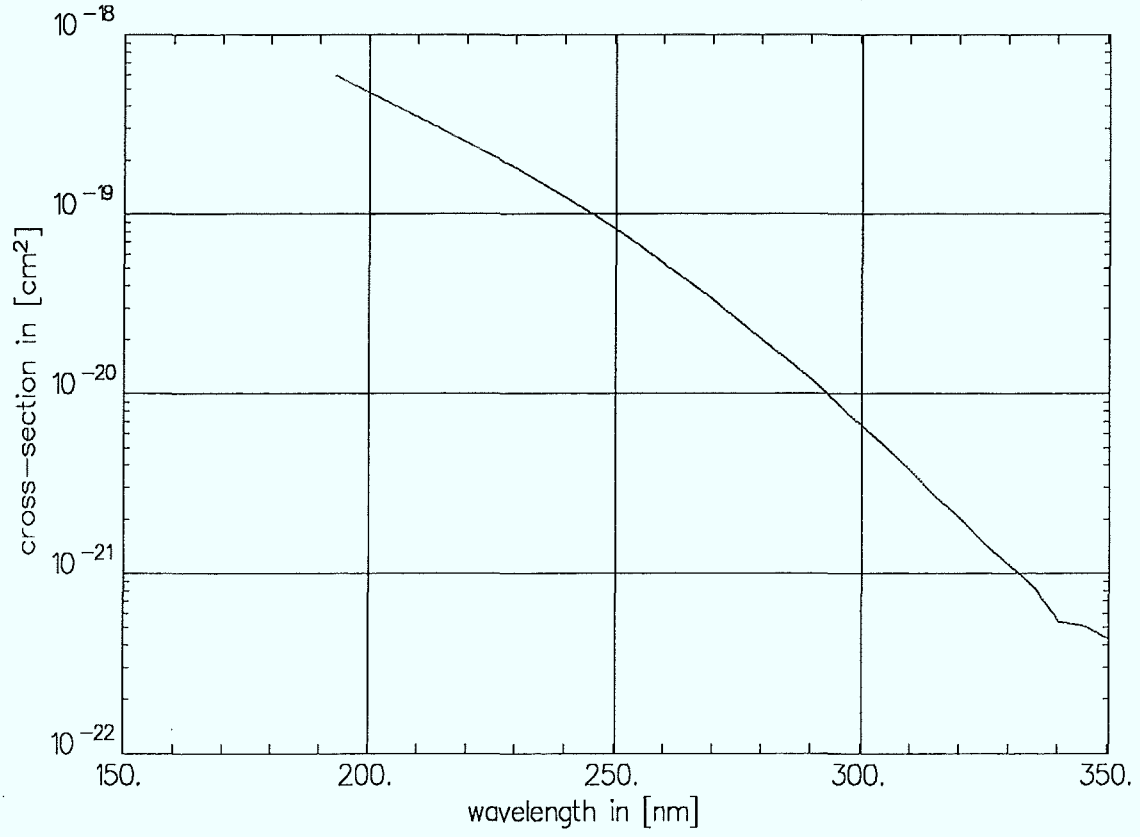
Substance: $H_2O_2$

Reference:
Nicovich, J.M., and P.H. Wine, Temperature-Dependent Absorption Cross Sections for Hydrogen Peroxide Vapor, J. Geophys. Res., **93** (1988), 2417-2421

Data: table Resolution: 5.0 - 37.0 nm

Temperature: 300.. K

Temperature dependence: 300. / 285. K

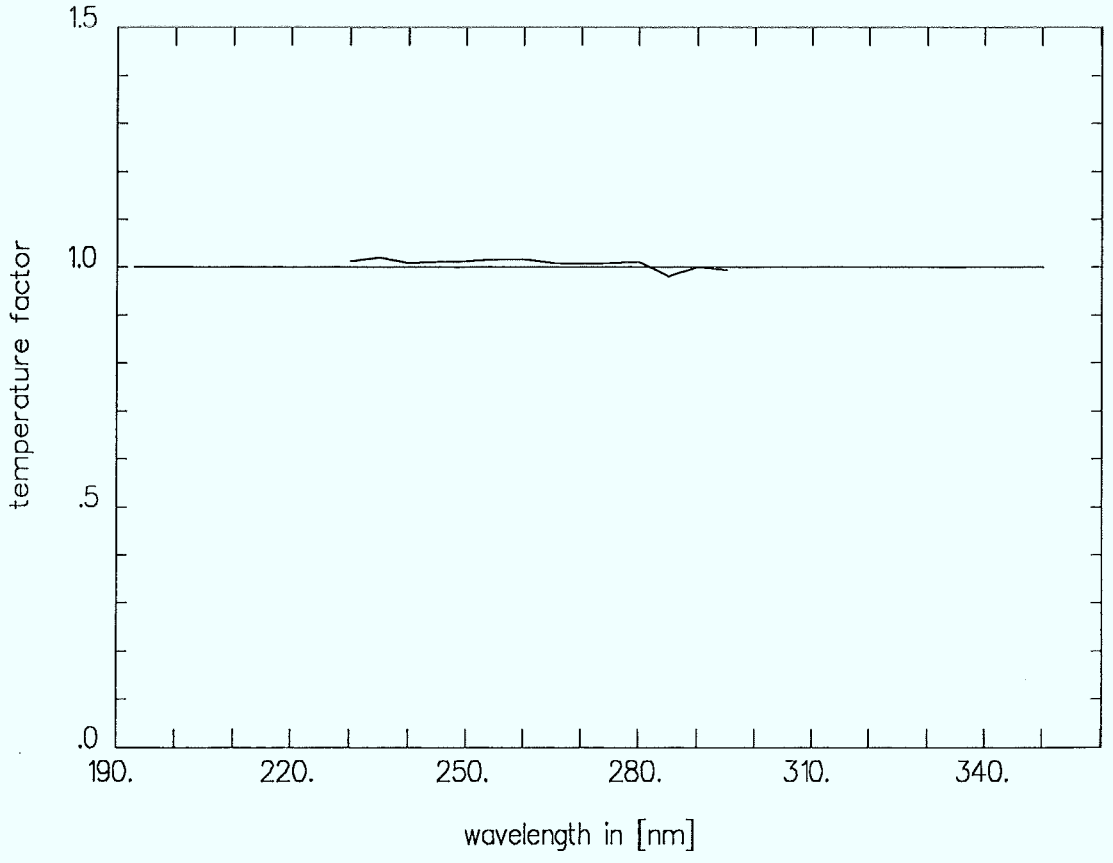


Substance: $H_2O_2$

Reference:
Nicovich, J.M., and P.H. Wine, Temperature-Dependent Absorption Cross Sections for Hydrogen Peroxide Vapor, J. Geophys. Res., **93** (1988), 2417-2421

Temperatures: 300. / 285. K

Function: not fitted



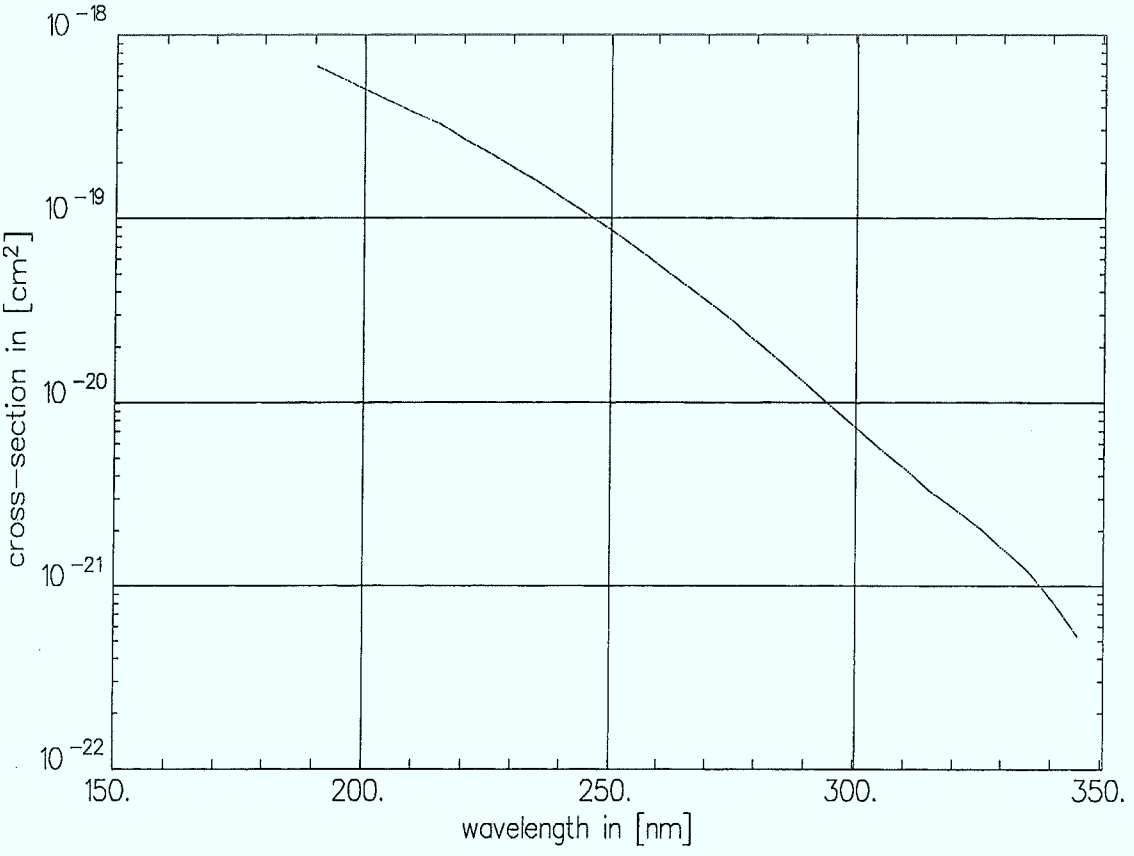
Substance: $H_2O_2$

Reference:
Vaghjiani, G.L., and A.R. Ravishankara, Absorption Cross Sections of $CH_3OOH$, $H_2O_2$, and $D_2O_2$ Vapors Between 210 and 365 nm at 297 K, J. Geophys. Res., **94** (1989), 3487-3492

Data: table Resolution: 5.0 nm

Temperature: 297. K

Temperature dependence: no



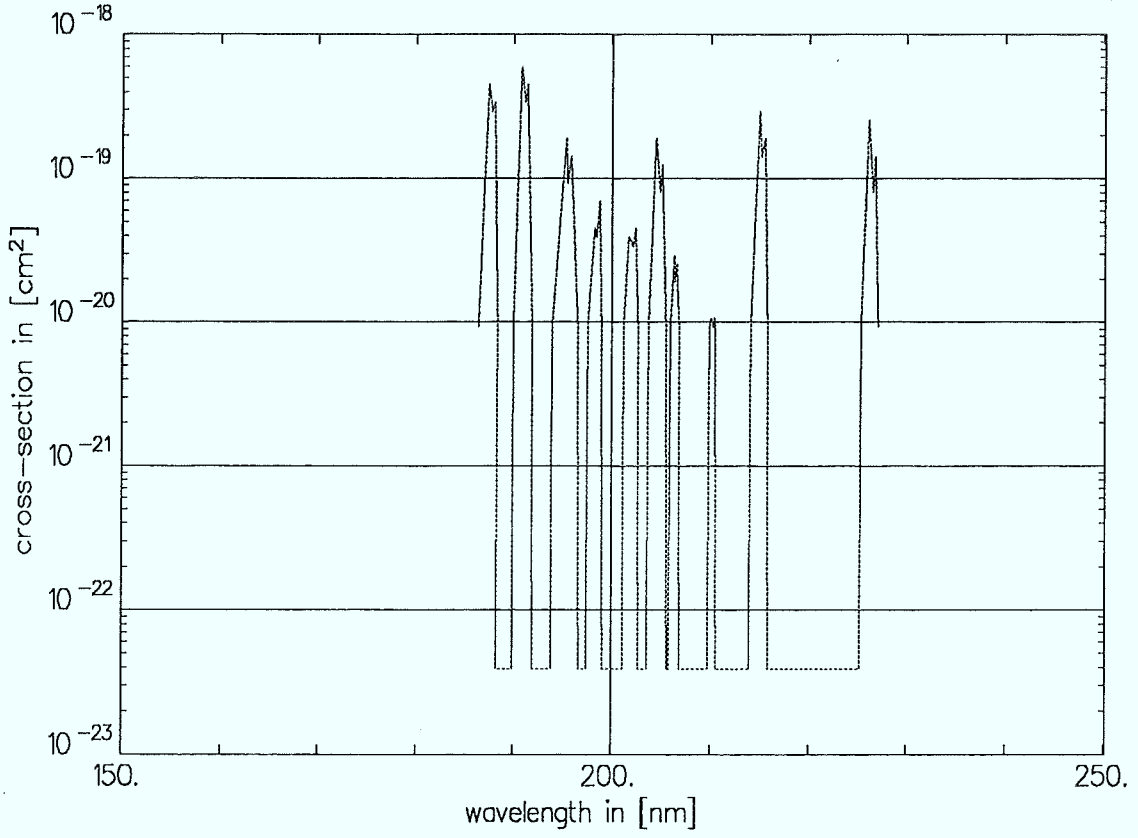
Substance: **NO**

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



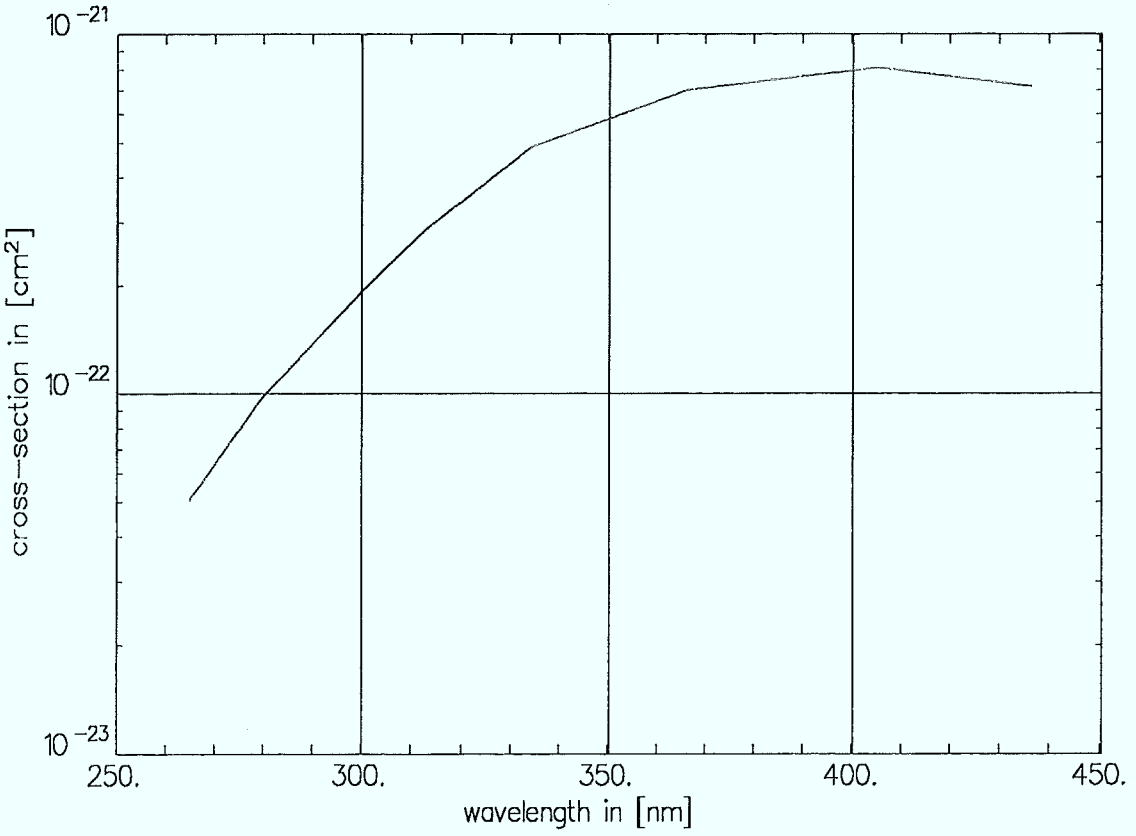
Substance: $NO_2$

Reference:
Holmes, H.H., and F. Daniels, The Photolysis of Nitrogen Oxides: $N_2O_5$, $N_2O_4$ and $NO_2$, J. Am. Chem. Soc., **56** (1934), 630-637

Data: table Resolution: 11.0 - 39.0 nm

Temperature: 273. K

Temperature dependence: no



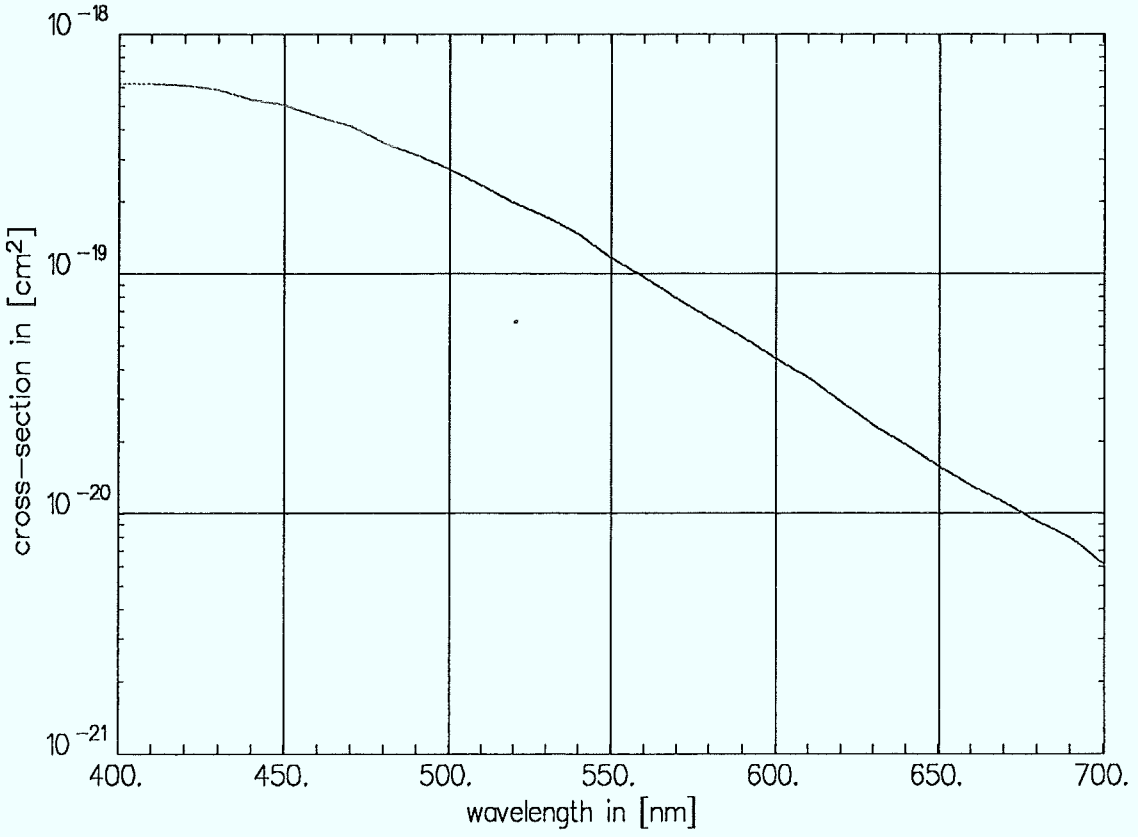
Substance: $NO_2$

Reference:
Dixon, J.K., The Absorption Coefficient of Nitrogen Dioxide in the Visible Spectrum, J. Chem. Phys., **8** (1940), 157-160

Data: diagram

Temperature: 273. K

Temperature dependence: no



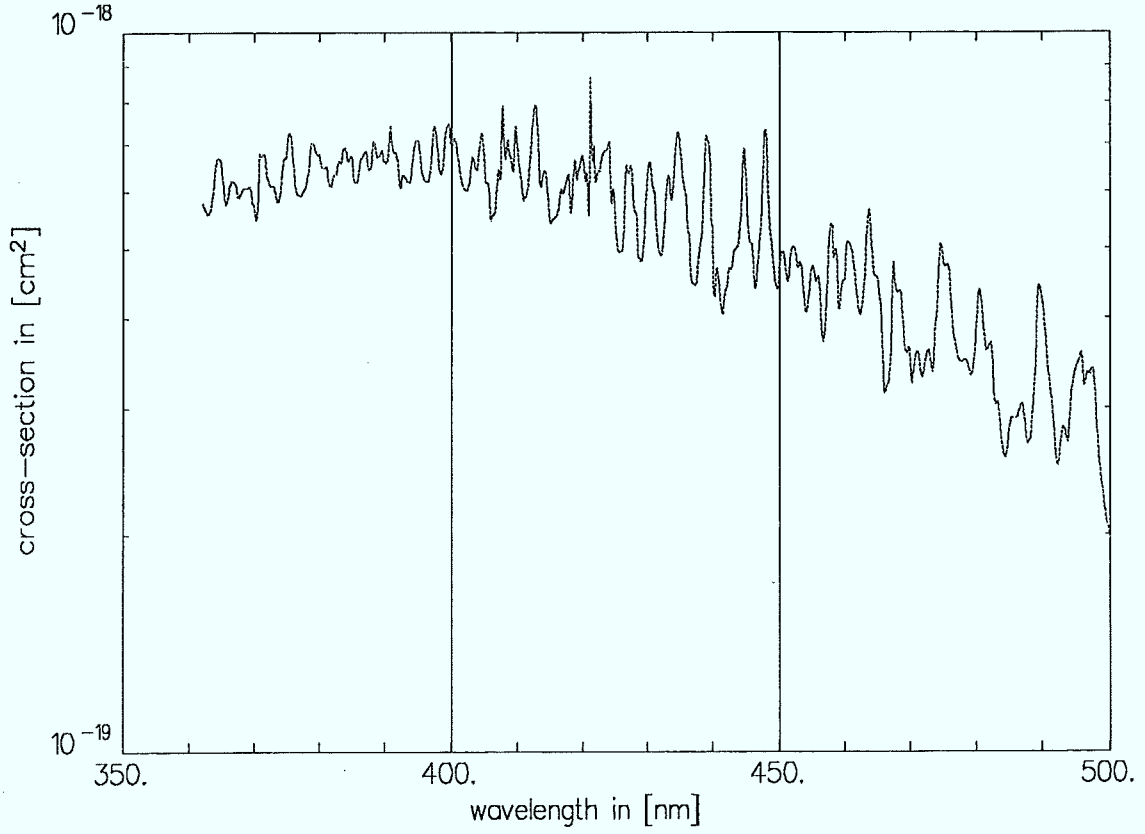
Substance: $NO_2$

Reference:
Hall, Jr., T.C., and F.E. Blacet, Separation of the Absorption Spectra of $NO_2$ and $N_2O_4$ in the Range of 2400-5000A, J. Chem. Phys., **20** (1952), 1745-1749

Data: diagram

Temperature: 298. K

Temperature dependence: no



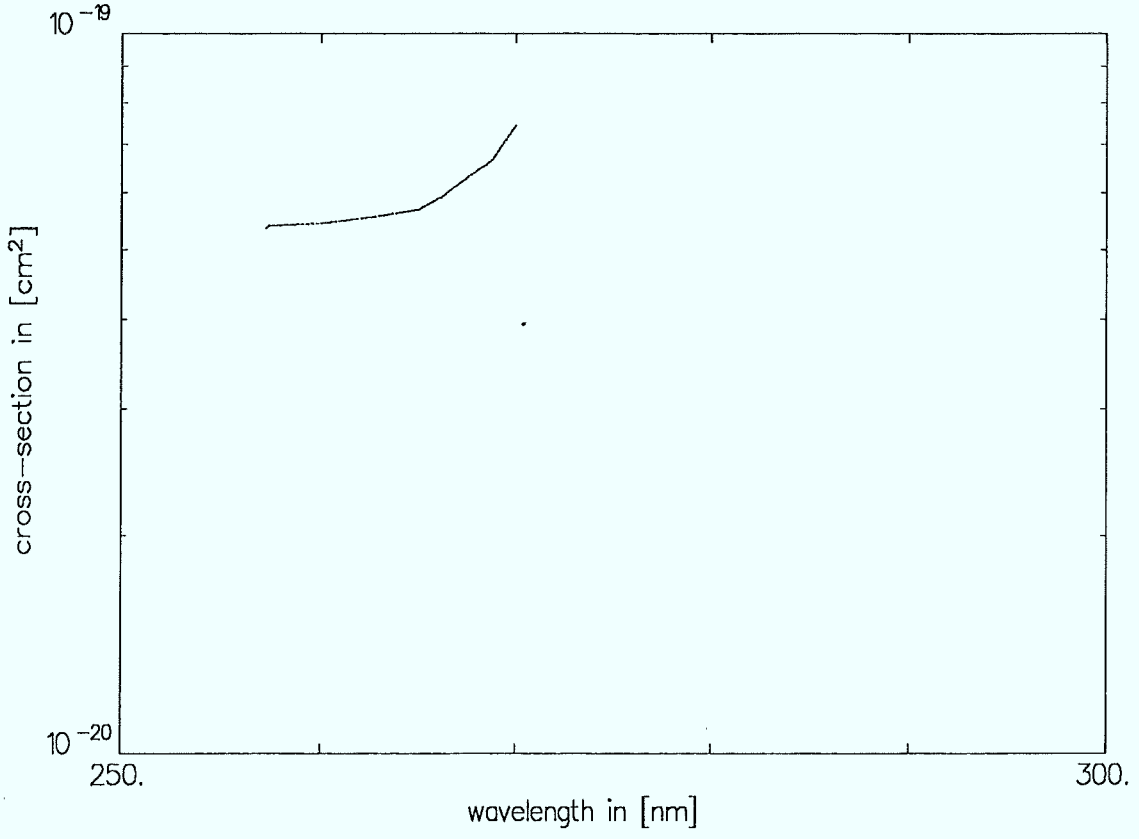
Substance: $NO_2$

Reference:
Nakayama, T., M.Y. Kitamura, and K. Watanabe, Ionization Potential and Absorption Coefficients of Nitrogen Dioxide, J. Chem. Phys., **30** (1959), 1180-1186

Data: diagram

Temperature: 298. K

Temperature dependence: no



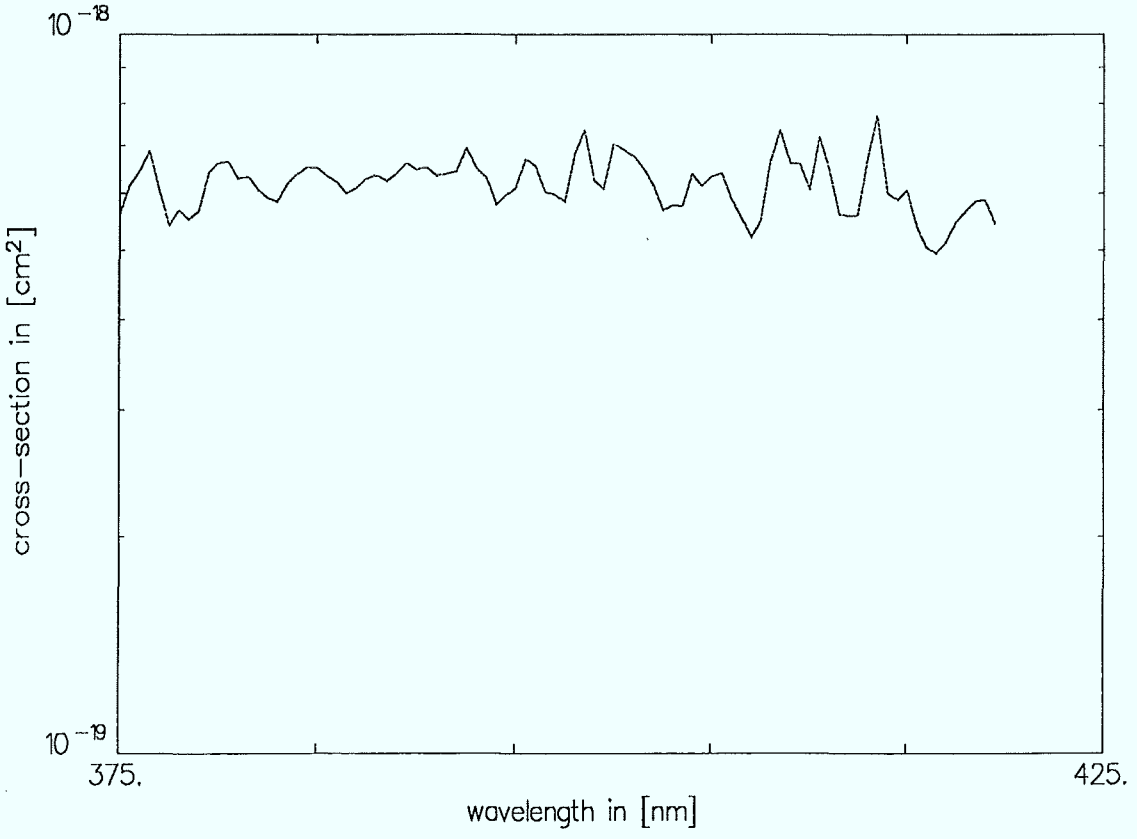
Substance: $NO_2$

Reference:
Harker, A.B., W. Ho, and J.J. Ratto, Photodissociation Quantum Yield of $NO_2$ in the Region 375 to 420 nm, Chem. Phys. Lett., **50** (1977), 394 -397

Data: diagram

Temperature: 296. K

Temperature dependence: no



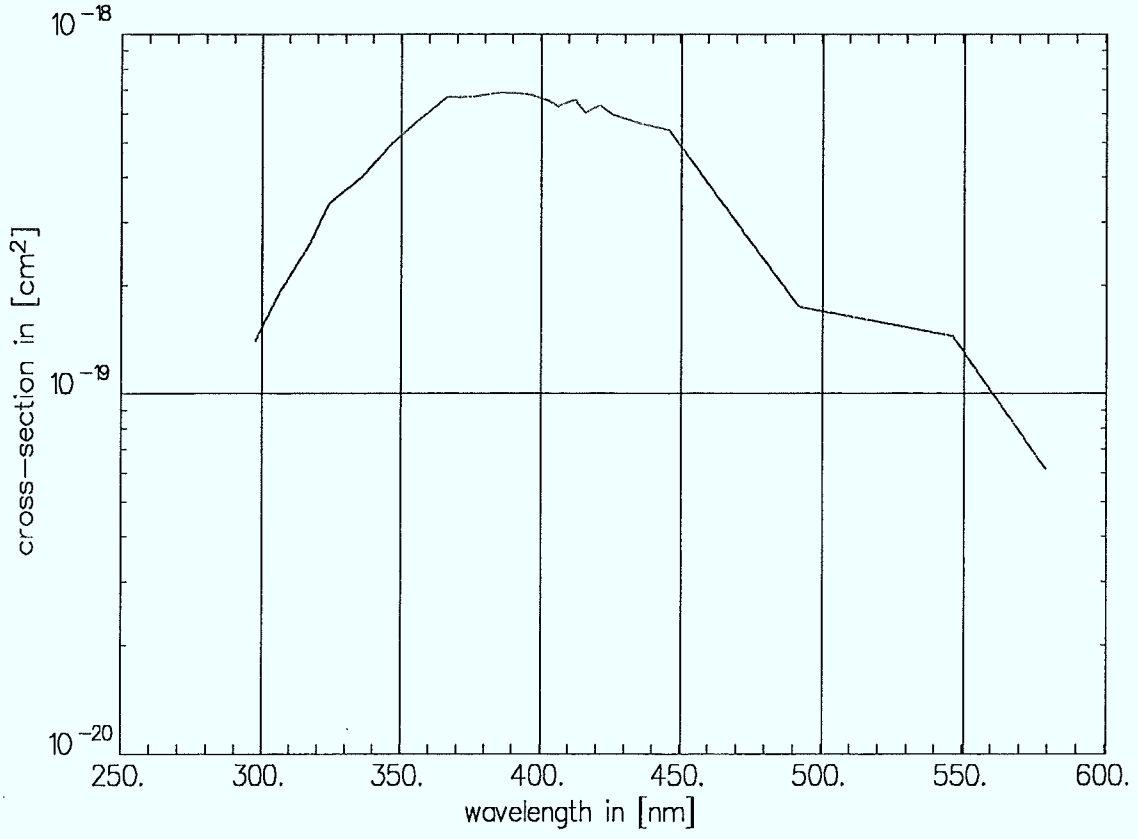
Substance: $NO_2$

Reference:
Jones, I.T.N., and K.D. Bayes, Photolysis of Nitrogen Dioxide, J. Chem. Phys., **59** (1973), 4836-4844

Data: table Resolution: 3.5 - 32.9 nm

Temperature: 300. K

Temperature dependence: no



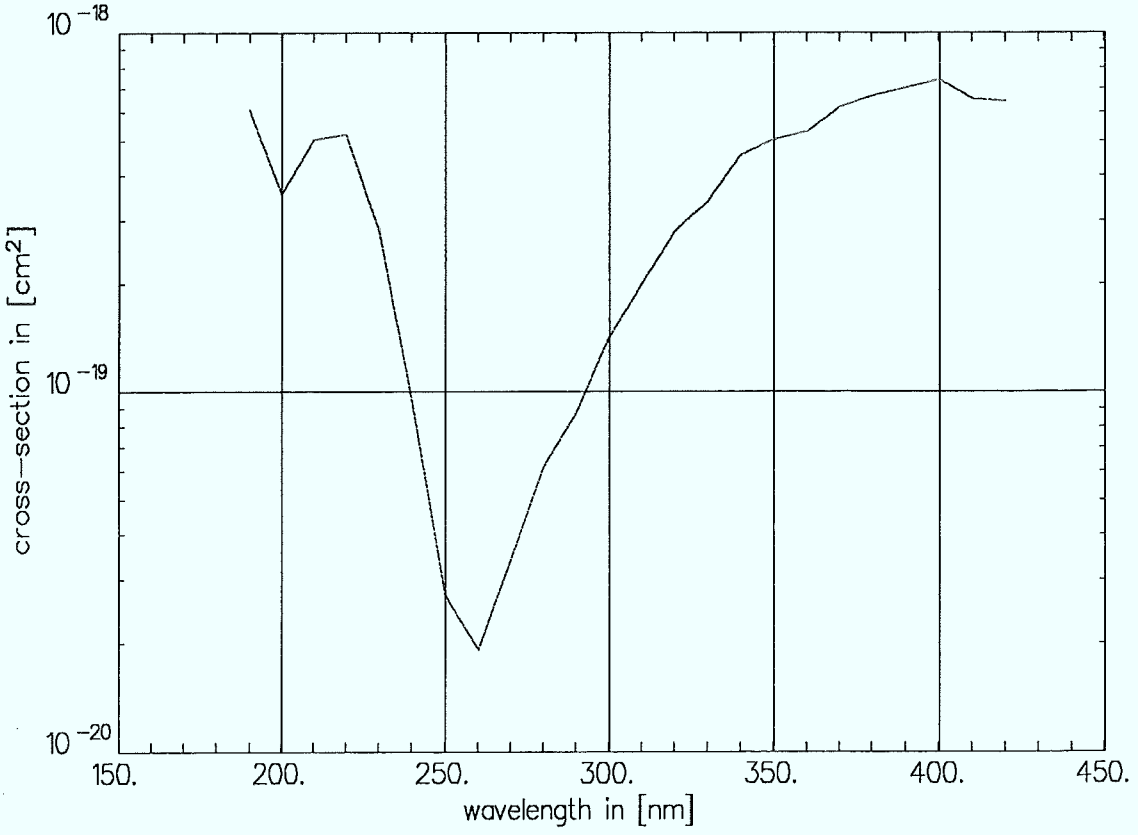
Substance: $NO_2$

Reference:
Johnston, H.S., S.-G. Chang, and G. Whitten, Photolysis of Nitric Acid Vapor, J. Phys. Chem., **78** (1974), 1-7

Data: diagram

Temperature: 298. K

Temperature dependence: no



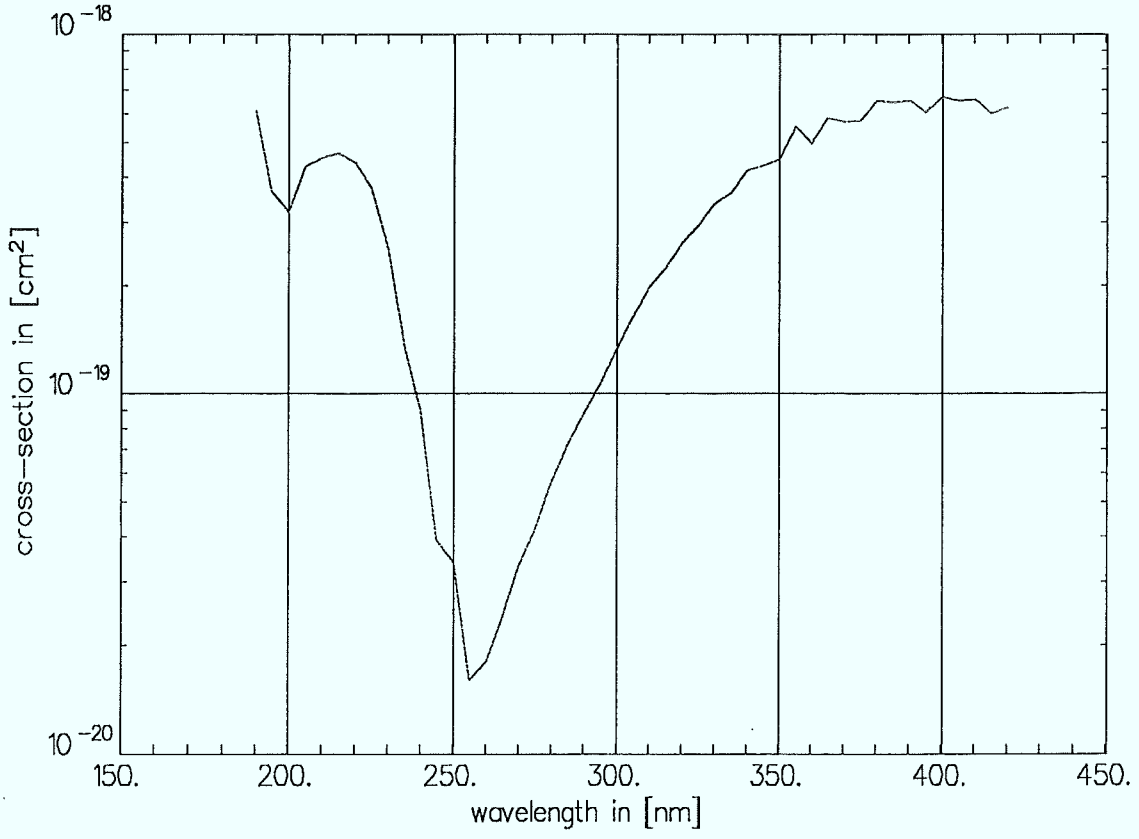
Substance: $NO_2$

Reference:
Johnston, H.S., and R. Graham, Photochemistry of $NO_X$ and $HNO_X$ Compounds, Can. J. Chem., **52** (1975), 1415-1423

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



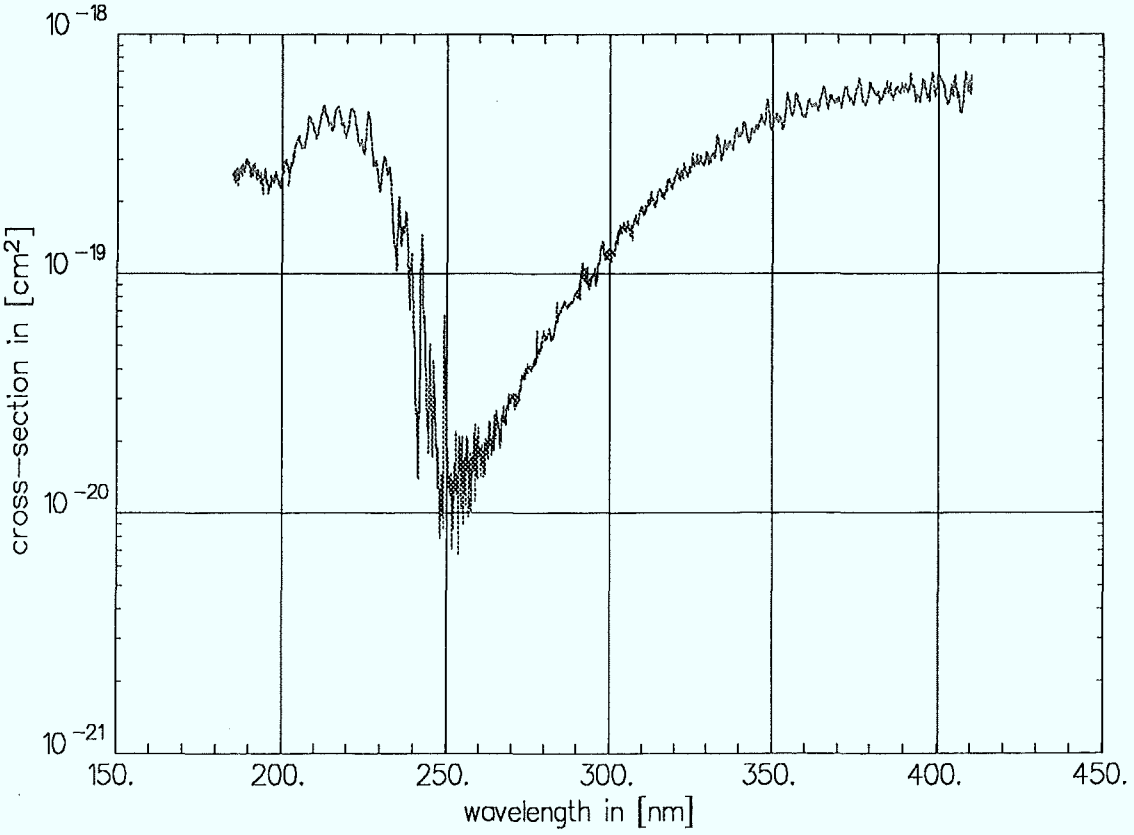
Substance: $NO_2$

Reference:
Bass, A.M., A.E. Ledford, Jr., and A.H. Lauffer, Extinction Coefficients of $NO_2$ and $N_2O_4$, J. Res. NBS, **80A** (1976), 143-166

Data: table Resolution: 0.13 nm

Temperature: 298. K

Temperature dependence: 298. / 235. K

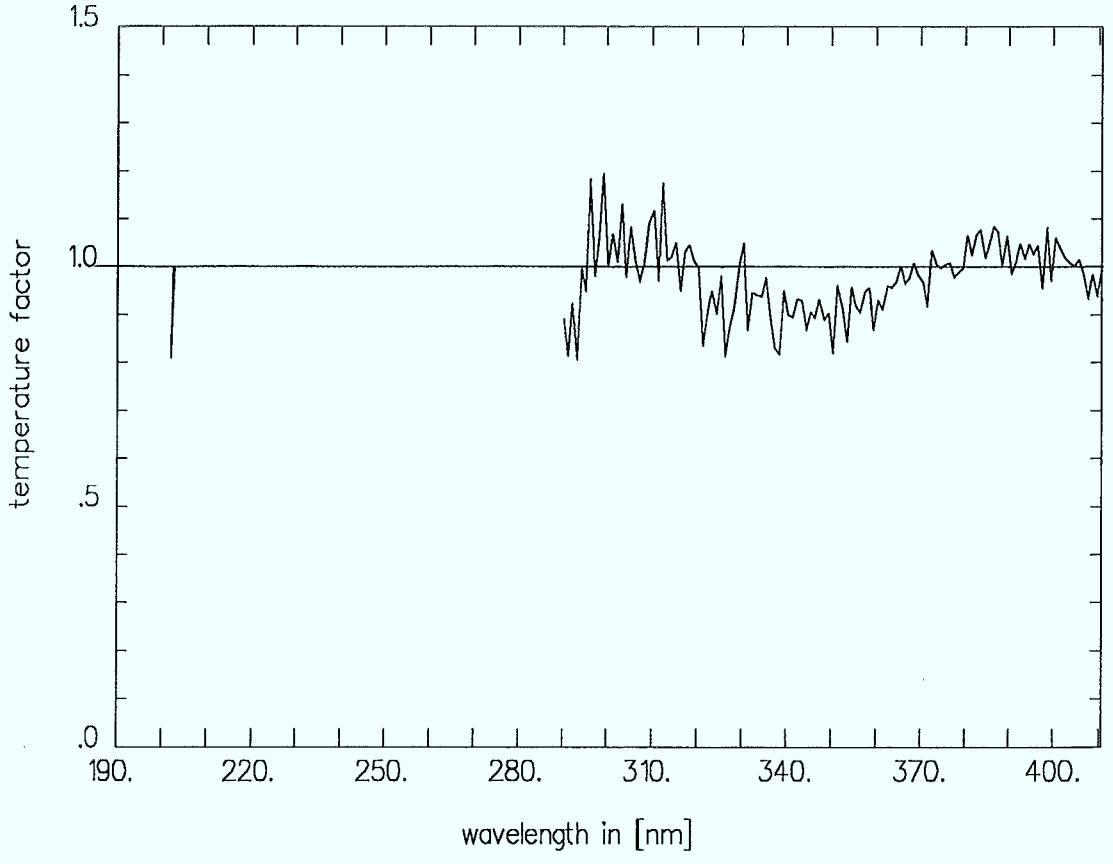


Substance: $NO_2$

Reference:
Bass, A.M., A.E. Ledford, Jr., and A.H. Lauffer, Exrinction Coefficients of $NO_2$ and $N_2O_4$, J. Res. NBS, **80A** (1976), 143-166

Temperatures: 298. / 235. K

Function: not fitted



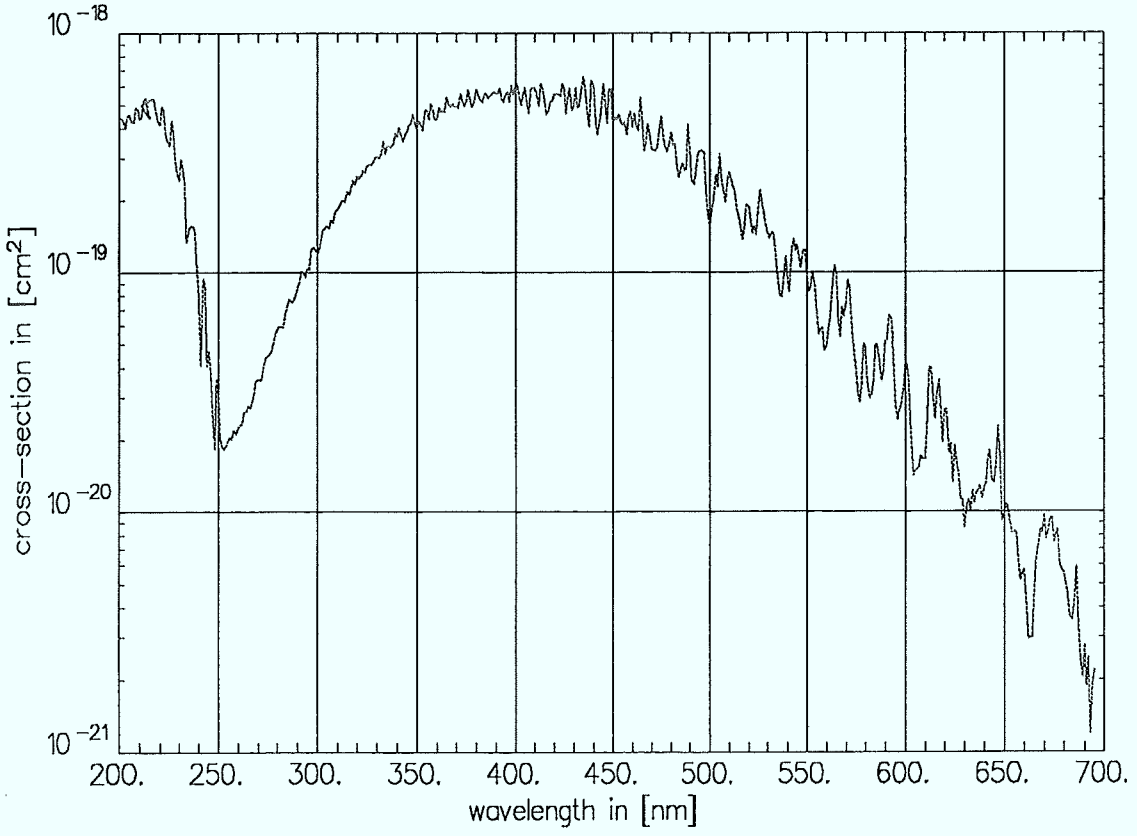
Substance: $NO_2$

Reference:
Schneider, W., G.K. Moortgat, G.S. Tyndall, and J.P. Burrows, Absorption Cross-Sections of $NO_2$ in the UV and Visible Region (200 - 700 nm) at 298 K, J. Photochem. Photobiol., **40** (1987), 195-217

Data: disk Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no



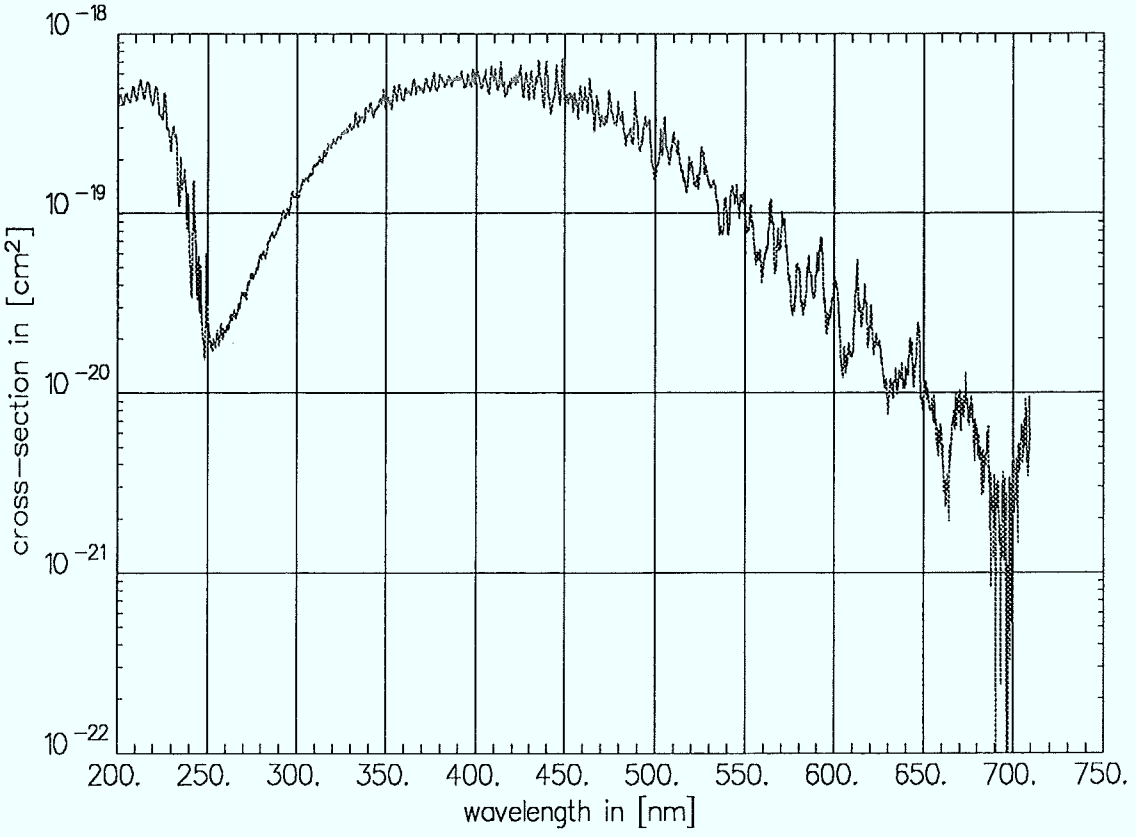
Substance: $NO_2$

Reference:
W. Schneider, G.K. Moortgat, G.S. Tyndall, and J.P. Burrows, priv. comm., MPI Mainz, Germany, 1986

Data: disk Resolution: 0.2 nm

Temperature: 298. K

Temperature dependence: no



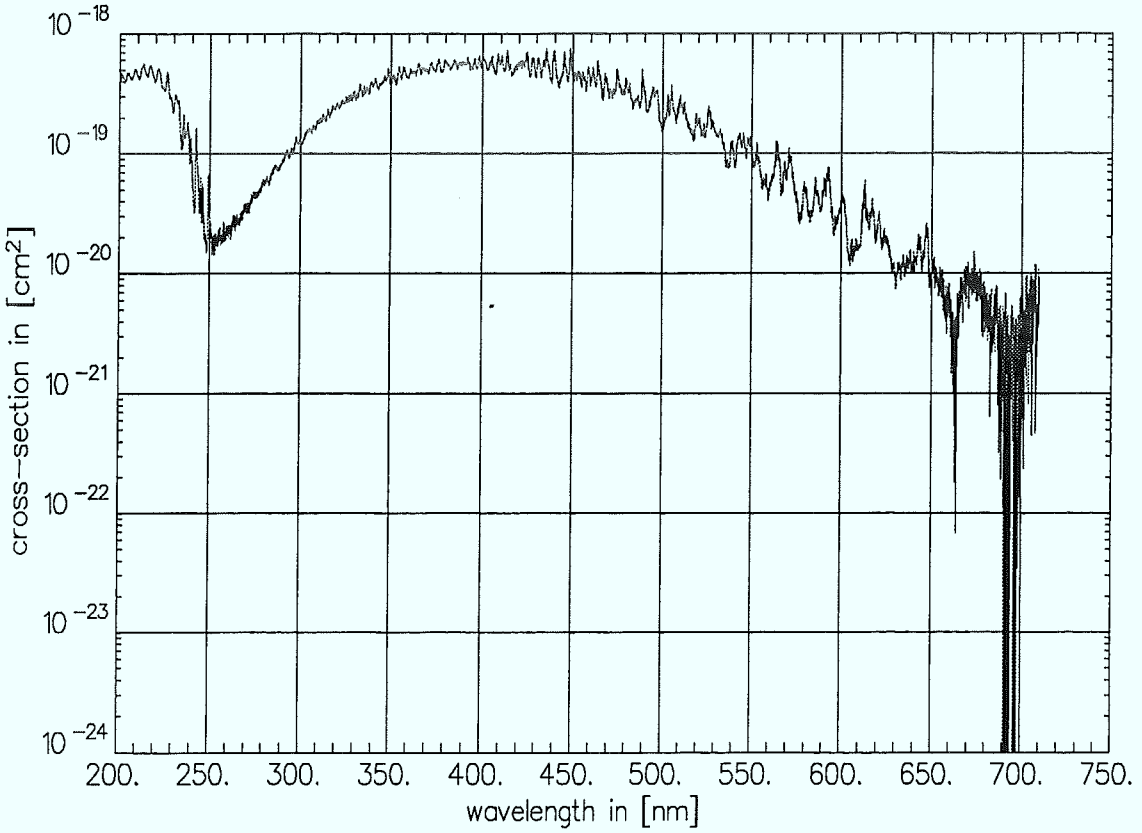
Substance: $NO_2$

Reference:
W. Schneider, G.K. Moortgat, G.S. Tyndall, and J.P. Burrows, priv. comm., MPI Mainz, Germany, 1986

Data: disk Resolution: 0.025 nm

Temperature: 298. K

Temperature dependence: no



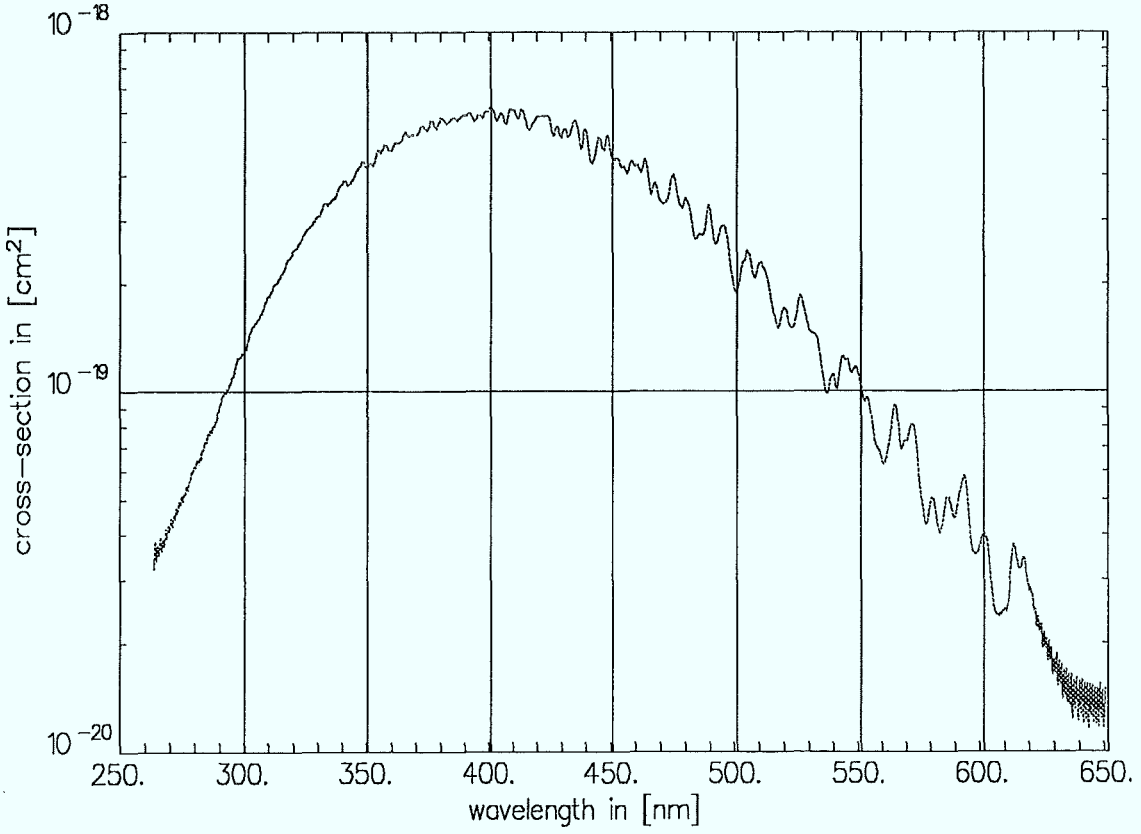
Substance: $NO_2$

Reference:
Davidson, J.A., C.A. Cantrell, A.H. McDaniel, R.E. Shetter, S. Madronich, and J.G. Calvert, Visible-Ultraviolet Absorption Cross Sections for $NO_2$ as a Function of Temperature, J. Geophys. Res., **93** (1988), 7105-7112

Data: disk Resolution: 0.5 - 0.6 nm

Temperature: 298. K

Temperature dependence: 298. / 265. / 233. K



Substance: $NO_2$

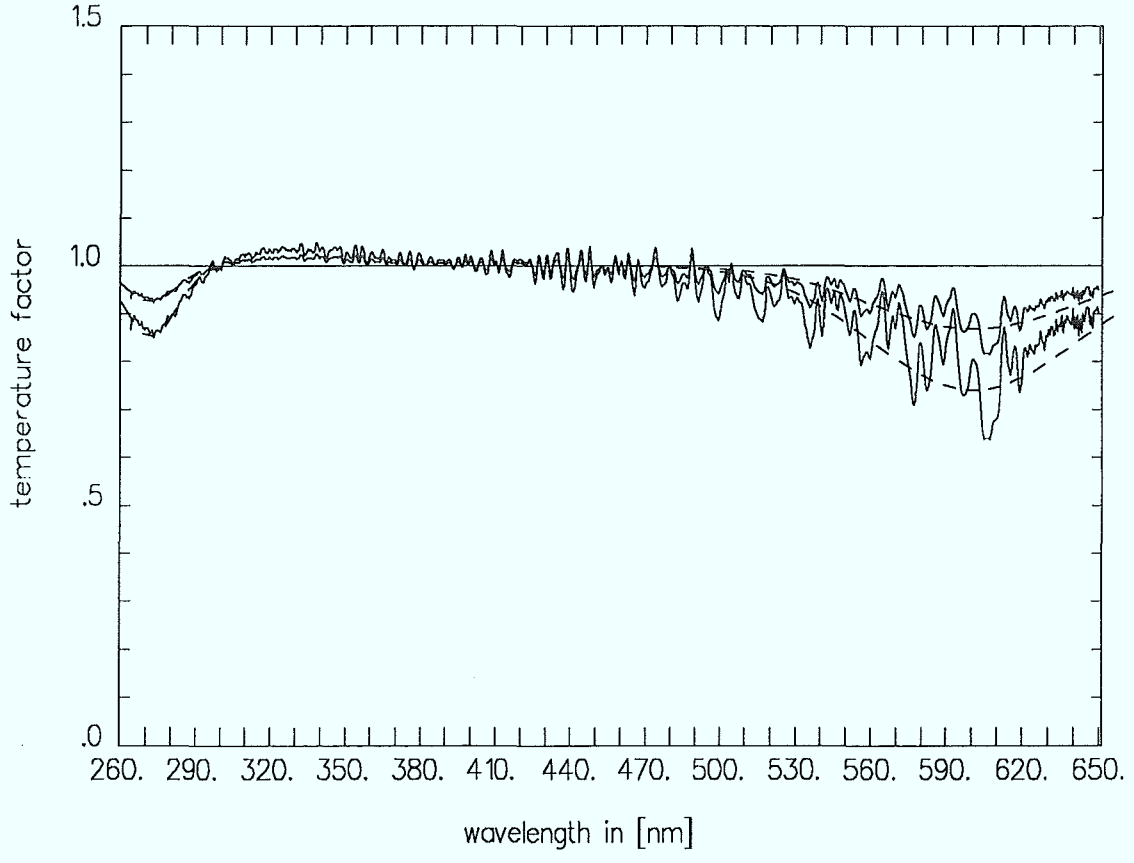
Reference:
Davidson, J.A., C.A. Cantrell, A.H. McDaniel, R.E. Shetter, S. Madronich, and J.G. Calvert, Visible-Ultraviolet Absorption Cross Sections for $NO_2$ as a Function of Temperature, J. Geophys. Res., **93** (1988), 7105-7112

Temperatures: 298. / 265. / 233. K

Function: 3

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 2.3E-3 | b = | -5.E-3 | $\lambda_1$ = | 272. |
| c = | 4.E-3 | d = | -3.E-4 | $\lambda_2$ = | 600. |



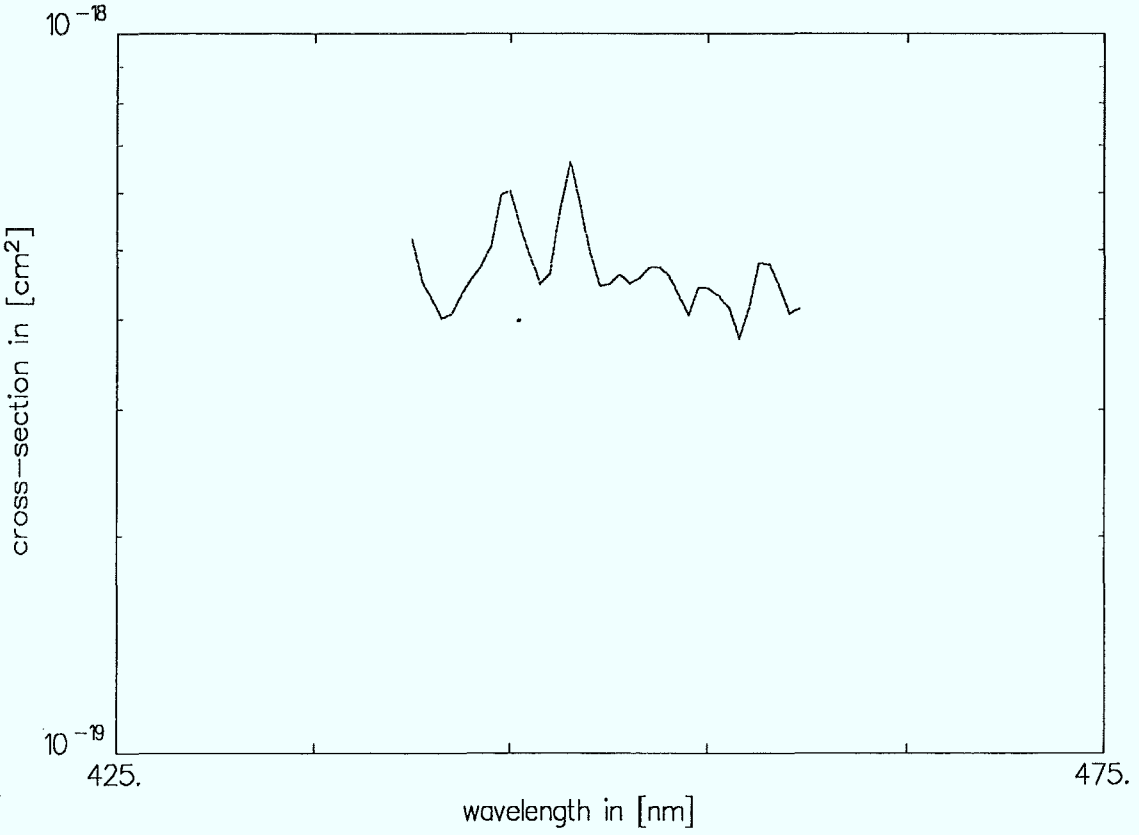
Substance: $NO_2$

Reference:
Amoruso, A., L. Crescentine, G. Fiocco, and M. Volpe, New Measurements of the $NO_2$ Absorption Cross Section in the 440- to 460-nm Region and Estimates of the $NO_2$-$N_2O_4$ Equilibrium Constant, J. Geophys. Res., **98** (1993), 16857-16863

Data: table Resolution: 0.5 nm

Temperature: 298. K

Temperature dependence: 298. / 220. K

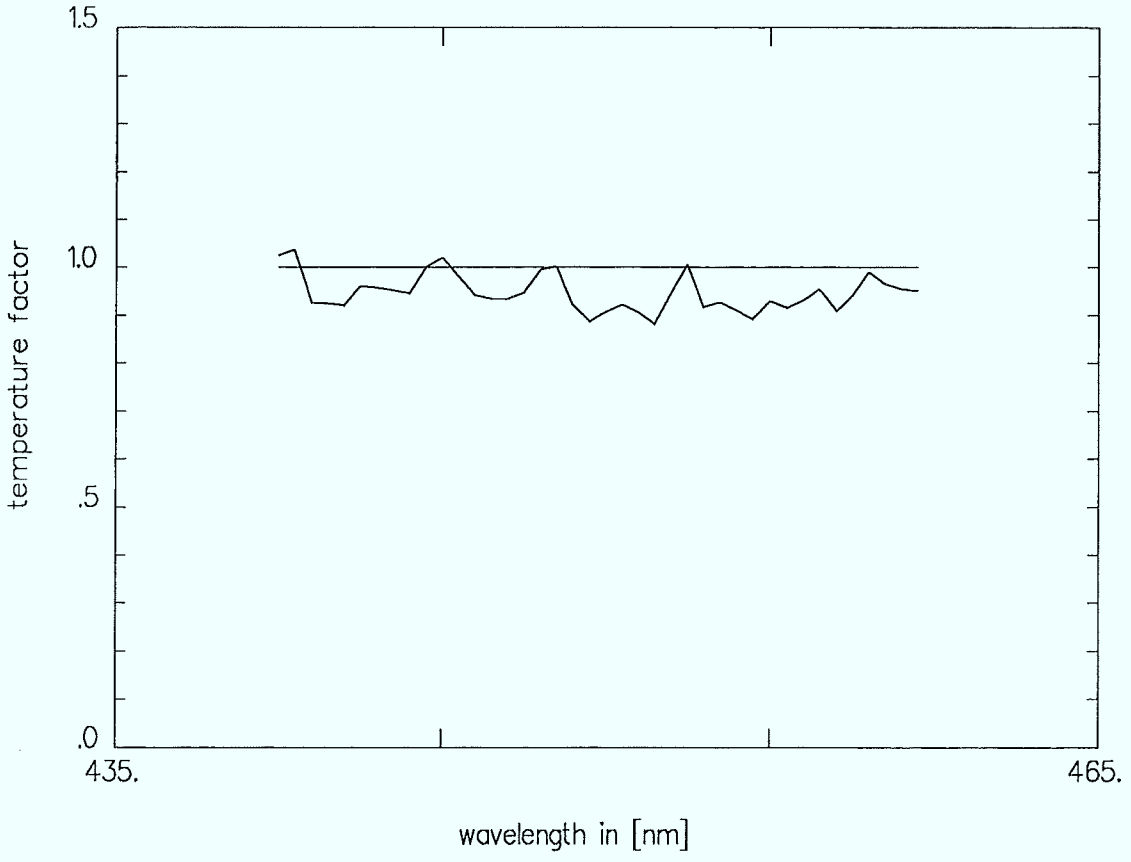


Substance: $NO_2$

Reference:
Amoruso, A., L. Crescentine, G. Fiocco, and M. Volpe, New Measurements of the $NO_2$ Absorption Cross Section in the 440- to 460-nm Region and Estimates of the $NO_2$-$N_2O_4$ Equilibrium Constant, J. Geophys. Res., **98** (1993), 16857-16863

Temperatures: 298. / 220. K

Function: not fitted



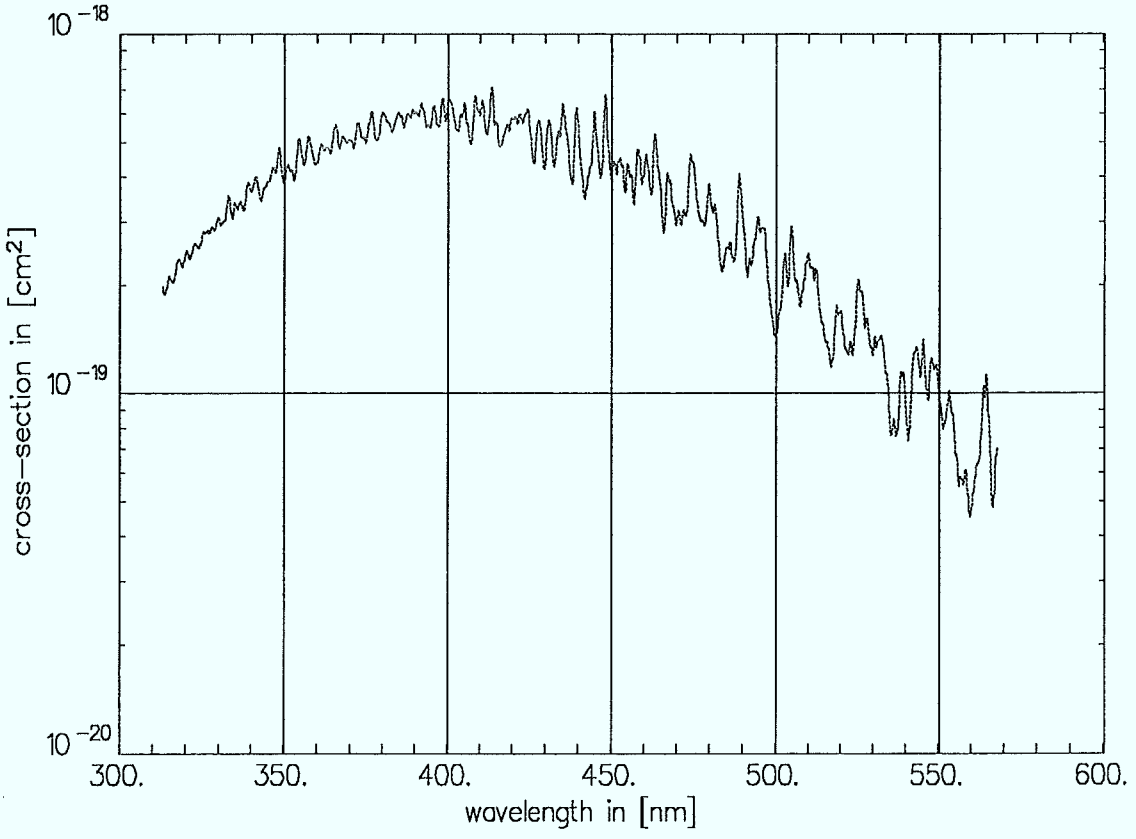
Substance: $NO_2$

Reference:
Harwood, M.H., and R.L. Jones, Temperature Dependent Ultraviolet-Visible Absorption Cross Sections of $NO_2$ and $N_2O_4$: Low-Temperature Measurements of the Equilibrium Constant of $2NO_2 <=> N_2O_4$, J. Geophys. Res., **99** (1994), 22955-22964.

Data: disk Resolution: 0.15 nm

Temperature: 298. K

Temperature dependence: 298. / 273. K down to 213. K in 10 K steps

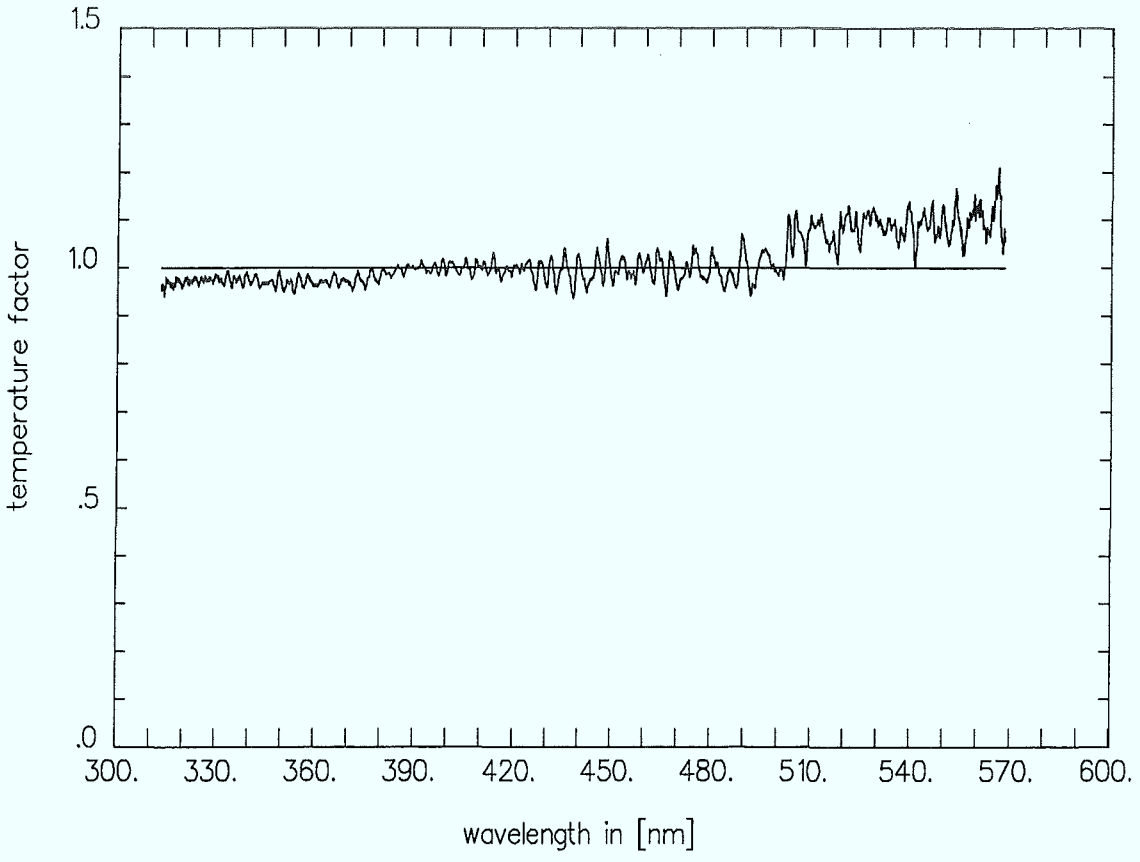


Substance: $NO_2$

Reference:
Harwood, M.H., and R.L. Jones, Temperature Dependent Ultraviolet-Visible Absorption Cross Sections of $NO_2$ and $N_2O_4$: Low-Temperature Measurements of the Equilibrium Constant of $2NO_2 <=> N_2O_4$, J. Geophys. Res., **99** (1994), 22955-22964.

Temperatures: 298. / 253. K

Function: not fitted



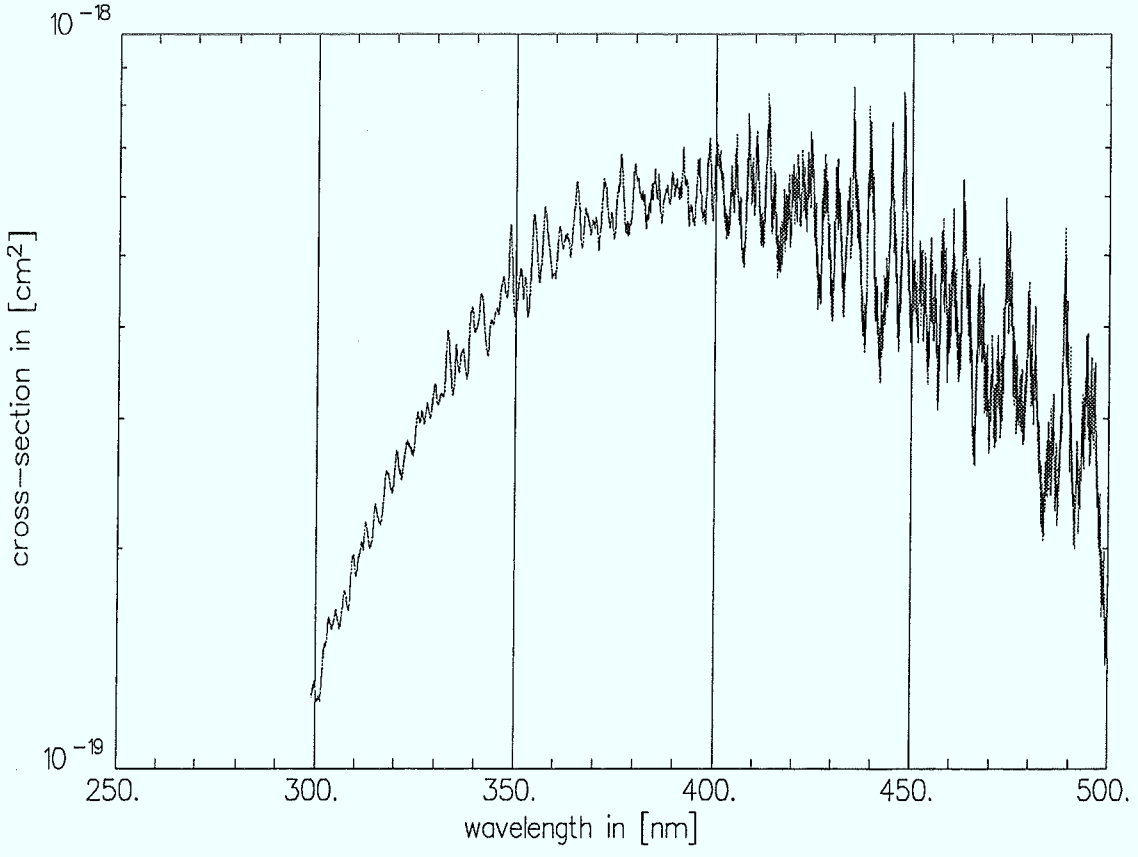
Substance: $NO_2$

Reference:
Coquart, B., A. Jenouvrier, and M. F. Merienne, The $NO_2$ Absorption Spectrum. II. Absorption Cross-Sections at Low Temperatures in the 400-500 nm Region, J. Atmos. Chem., **21** (1995), 251-261.

Data: disk Resolution: 0.01 nm

Temperature: 298. K

Temperature dependence: 298. / 240. / 220. K

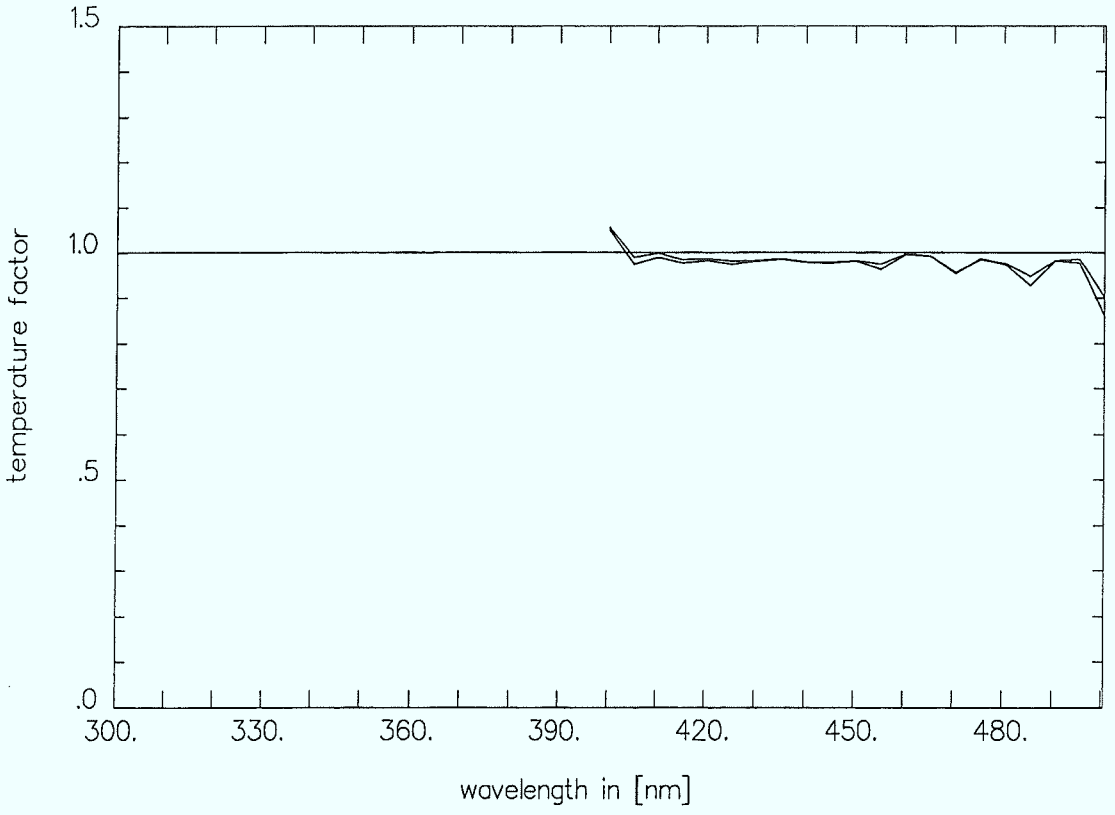


Substance: $NO_2$

Reference:
Coquart, B., A. Jenouvrier, and M. F. Merienne, The $NO_2$ Absorption Spectrum. II. Absorption Cross-Sections at Low Temperatures in the 400-500 nm Region, J. Atmos. Chem., **21** (1995), 251-261.

Temperatures: 298. / 240. / 220. K

Function: not fitted



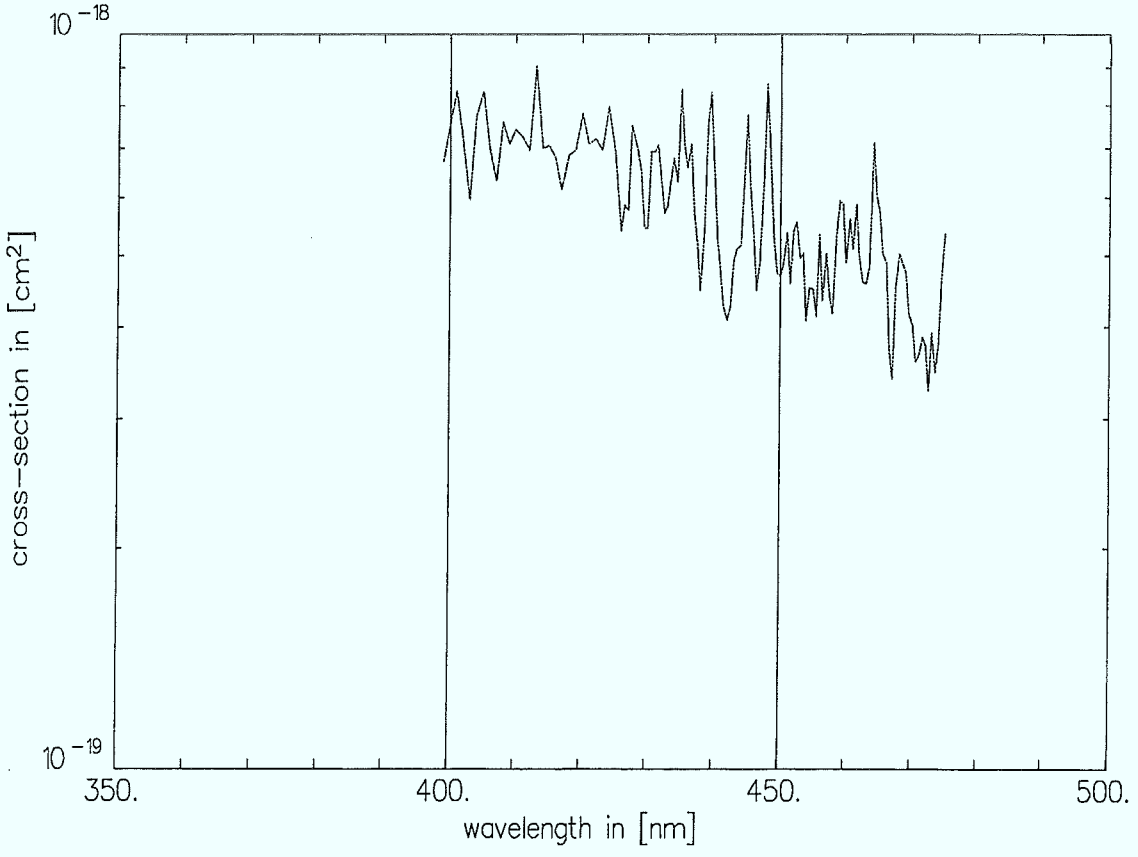
Substance: $NO_2$

Reference:
W. Kummer, Photochemische Bildung von $NO_2$ in der Reaktion von $NO_2$* mit $N_2$, Diploma-Thesis, University of Essen , Germany, 1995

Data: disk Resolution: 0.5 / 1.0 nm

Temperature: 298. K

Temperature dependence: no



Photolysis: $NO_2$ -> NO + O

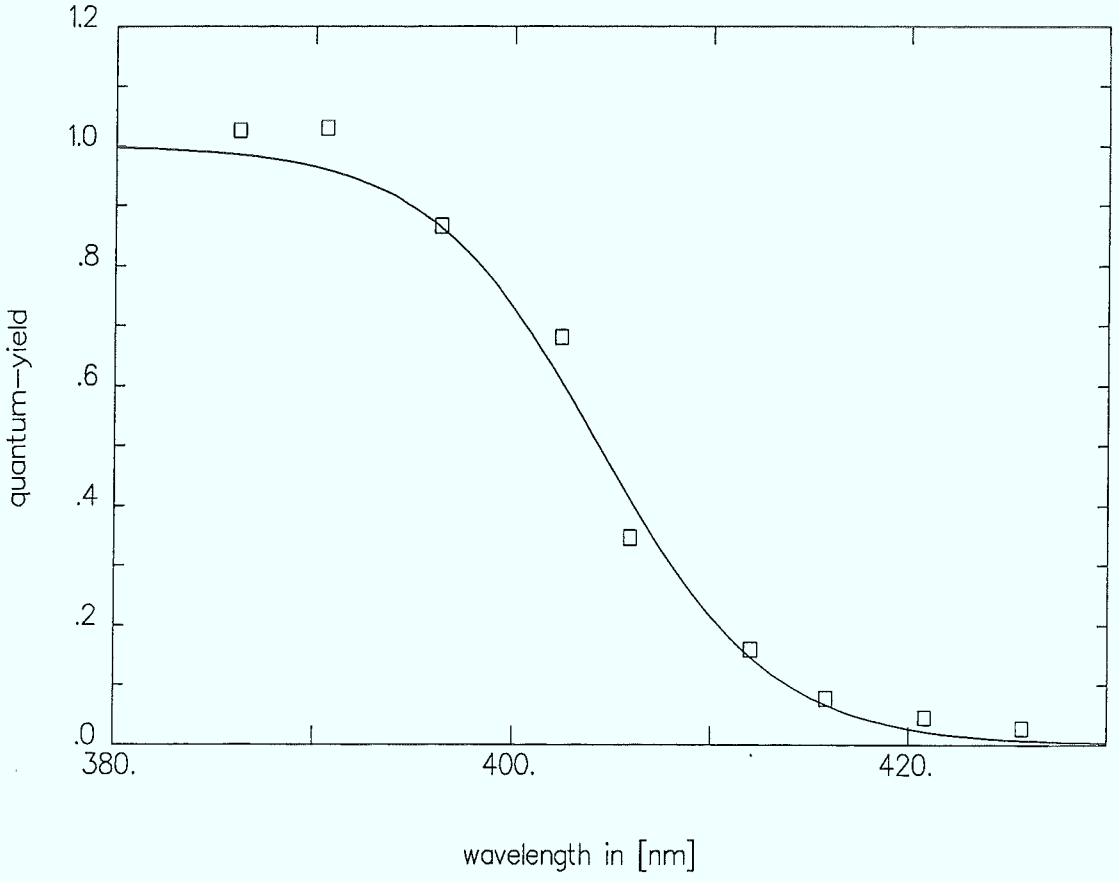
Reference:
Jones, I.T.N., and K.D. Bayes, Photolysis of Nitrogen Dioxide, J. Chem. Phys., **59** (1973), 4836-4844

Data: table Resolution: 4.4 - 6.1 nm

Temperature: 298. K

Function: 2

Fit Parameter: A = 1.0 B = 0.23 $\lambda_1$ = 404.3



Photolysis: $NO_2$ -> NO + O

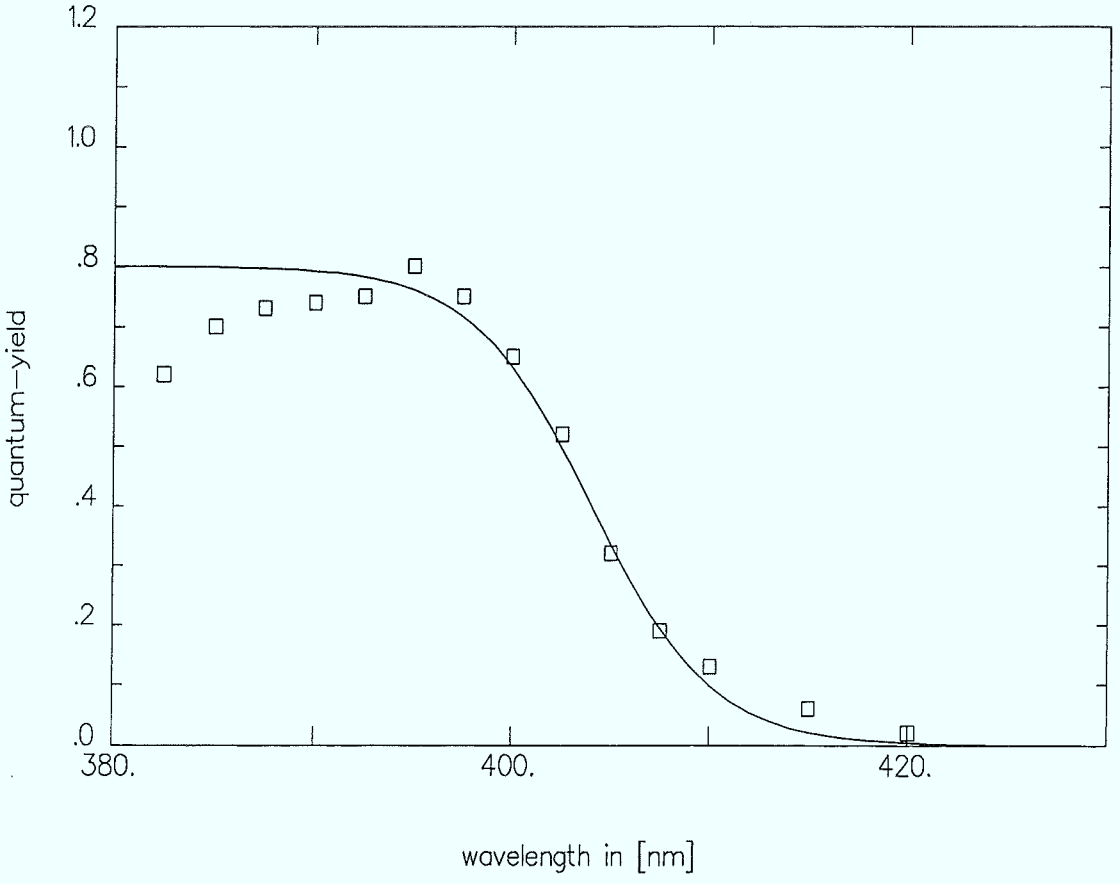
Reference:
Harker, A.B., W. Ho, and J.J. Ratto, Photodissociation Quantum Yield of $NO_2$ in the Region 375 to 420 nm, Chem. Phys. Lett., **50** (1977), 394 -397

Data: diagram

Temperature: 296. K

Function: 2

Fit Parameter: A = 0.8 B = 0.33 $\lambda_1$ = 404.



Photolysis: $NO_2$ -> NO + O

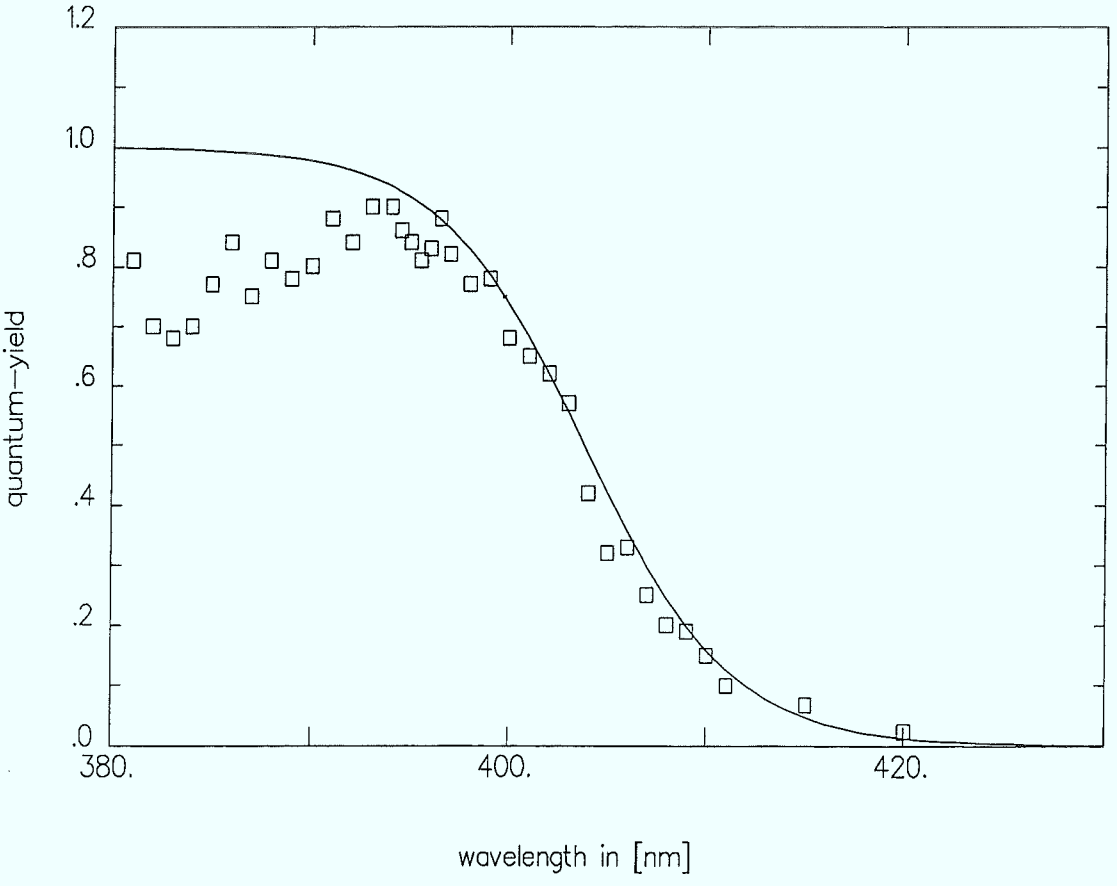
Reference:
NASA Panel for Data Evaluation, Chemical Kinetics and Photochemical Data for Use in Stratospheric Modeling, JPL Publication 85-37, 1985

Data: table Resolution: 1.0 - 5.0 nm

Temperature: 296. K

Function: 2

Fit Parameter: A = 1.0 B = 0.27 $\lambda_1$ = 403.8



Photolysis: $NO_2$ -> NO + O

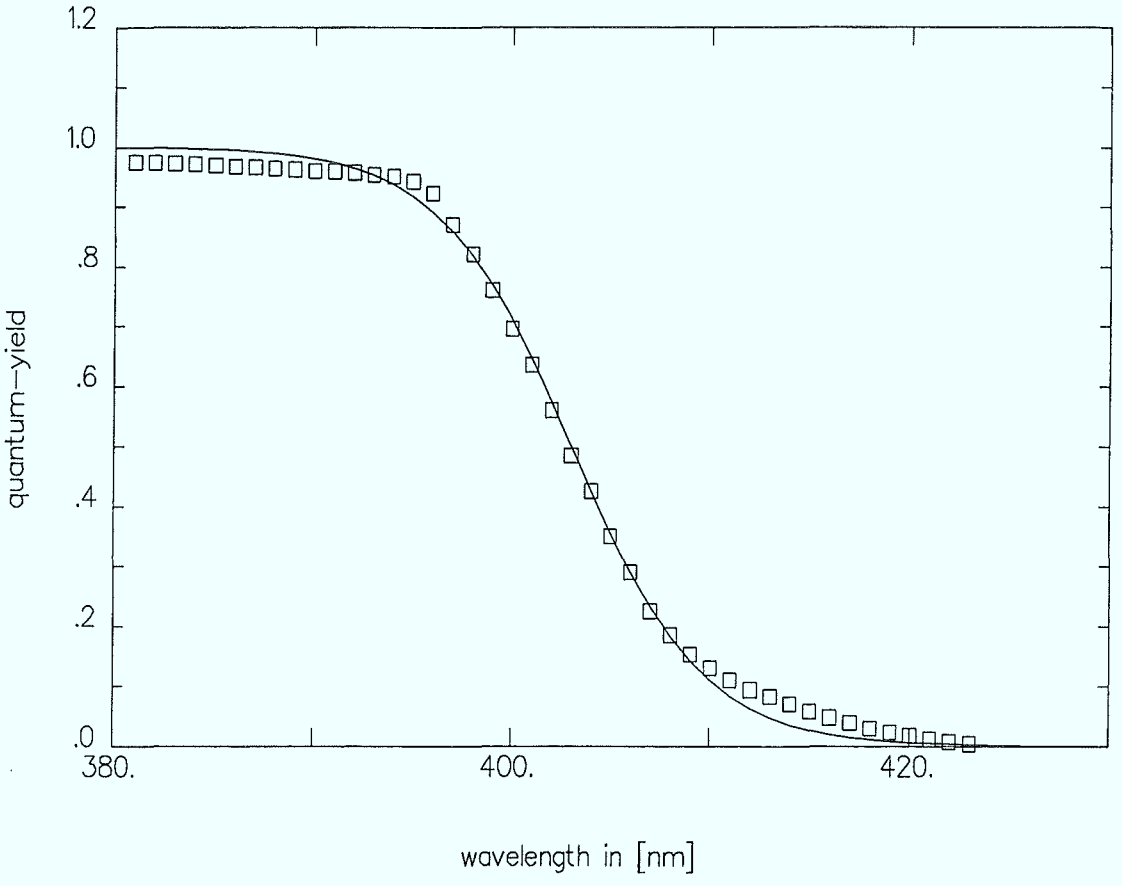
Reference:
NASA Panel for Data Evaluation, Chemical Kinetics and Photochemical Data for Use in Stratospheric Modeling, JPL Publication 92-20, 1992

Data: table Resolution: 1.0 nm

Temperature: 296. K

Function: 2

Fit Parameter: A = 1.0 B = 0.3 $\lambda_1$ = 403.



Photolysis: $NO_2$ -> NO + O

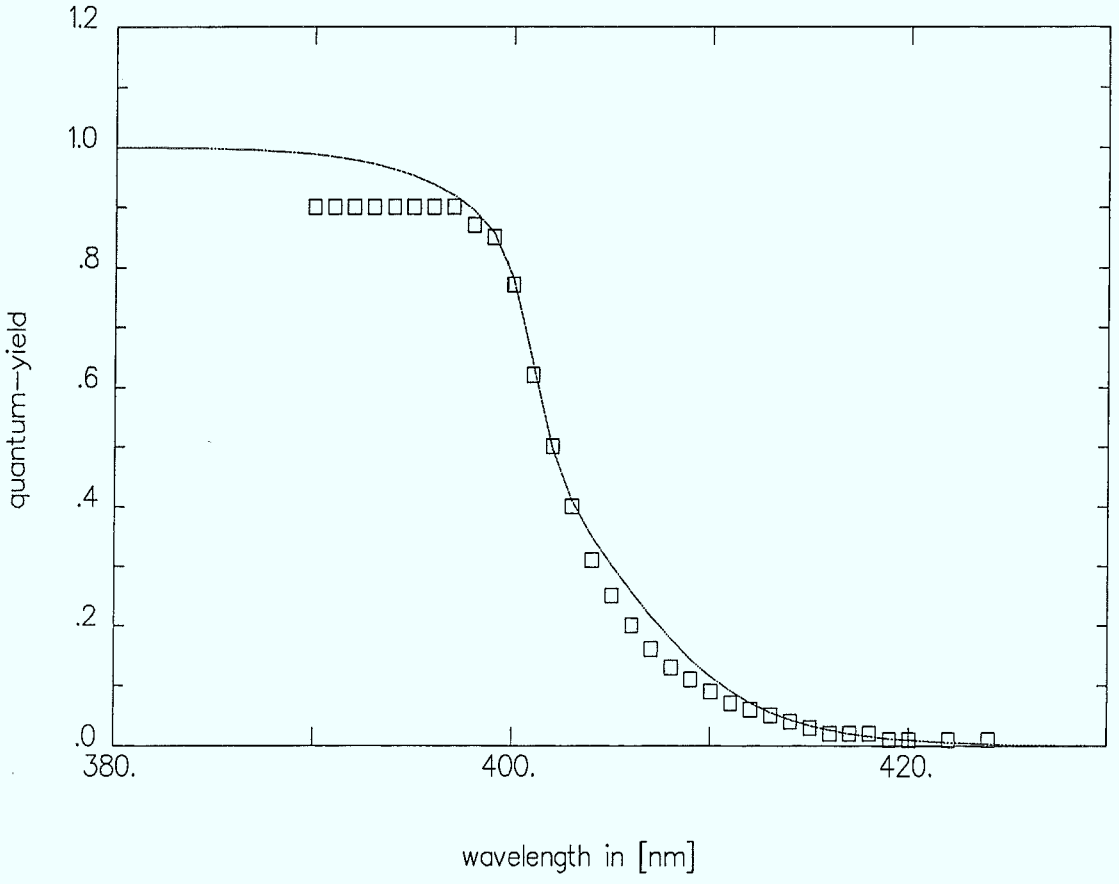
Reference:
Roehl, C.M., J.J. Orlando, G.S. Tyndall, R.E. Shetter, G.J. Vasquez, C.A. Cantrell, and J.G. Calvert, Temperature Dependence of the Quantum Yields for the Photolysis of $NO_2$ near the Dissociation Limit, J. Phys. Chem., **98** (1994), 7837-7843

Data: table Resolution: 1.0 - 2.0 nm

Temperature: 298. K

Function: 7

Fit Parameter: A = 0.33 B = 1.5 $\lambda_1$ = 389.52+0.1*T
C = 0.67 D = 0.275 $\lambda_2$ = 404.25



Photolysis: $NO_2$ -> NO + O

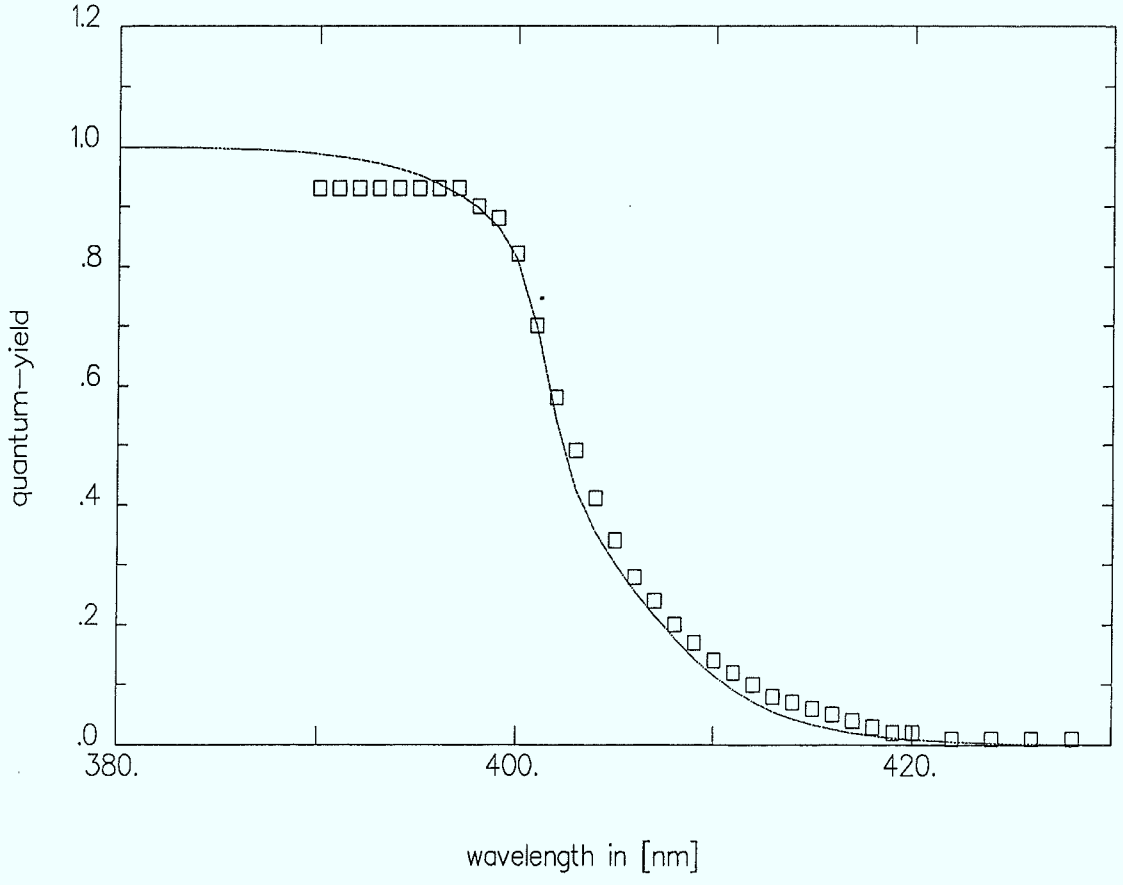
Reference:
Roehl, C.M., J.J. Orlando, G.S. Tyndall, R.E. Shetter, G.J. Vasquez, C.A. Cantrell, and J.G. Calvert, Temperature Dependence of the Quantum Yields for the Photolysis of $NO_2$ near the Dissociation Limit, J. Phys. Chem., **98** (1994), 7837-7843

Data: table Resolution: 1.0 - 2.0 nm

Temperature: 248. K

Function: 7

Fit Parameter: A = 0.33 B = 1.5 $\lambda_1$ = 389.52+0.1*T
C = 0.67 D = 0.275 $\lambda_2$ = 404.25



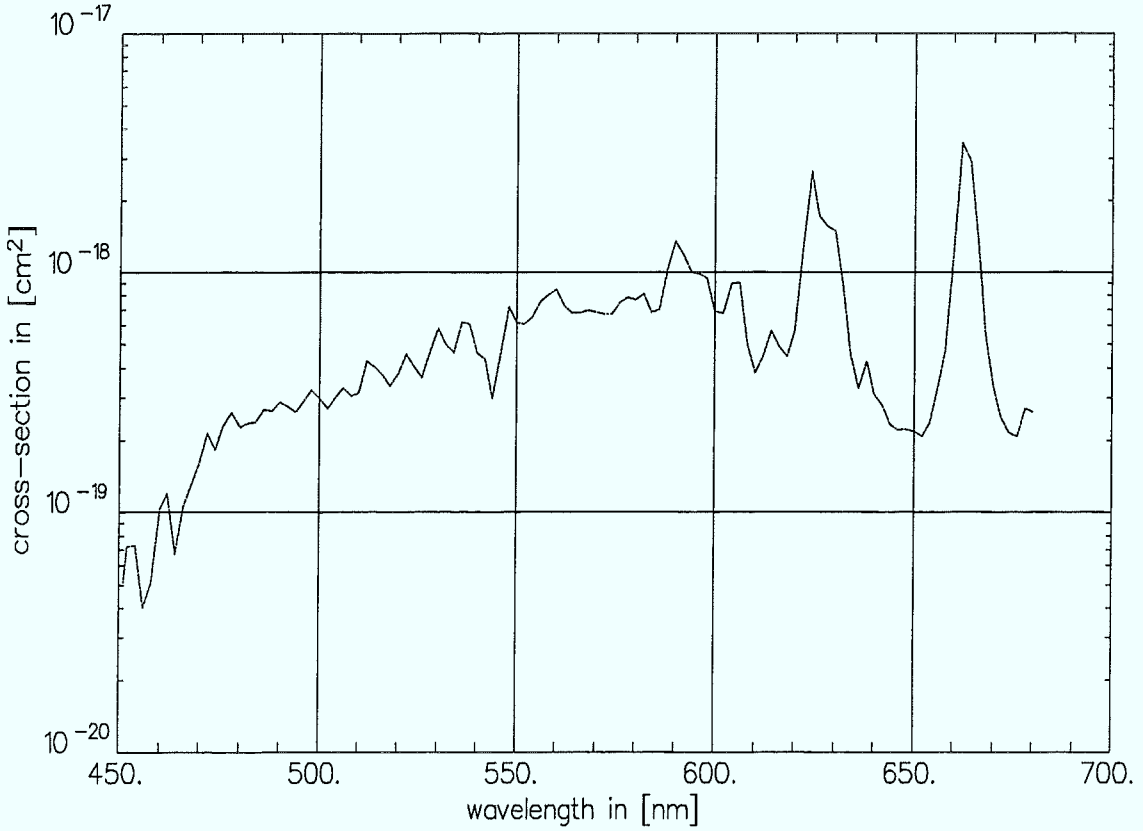
Substance: $NO_3$

Reference:
Johnston, H.S., and R. Graham, Photochemistry of $NO_X$ and $HNO_X$ Compounds, Can. J. Chem., **52** (1975), 1415-1423

Data: table Resolution: 1.0 nm

Temperature: 275. K

Temperature dependence: no



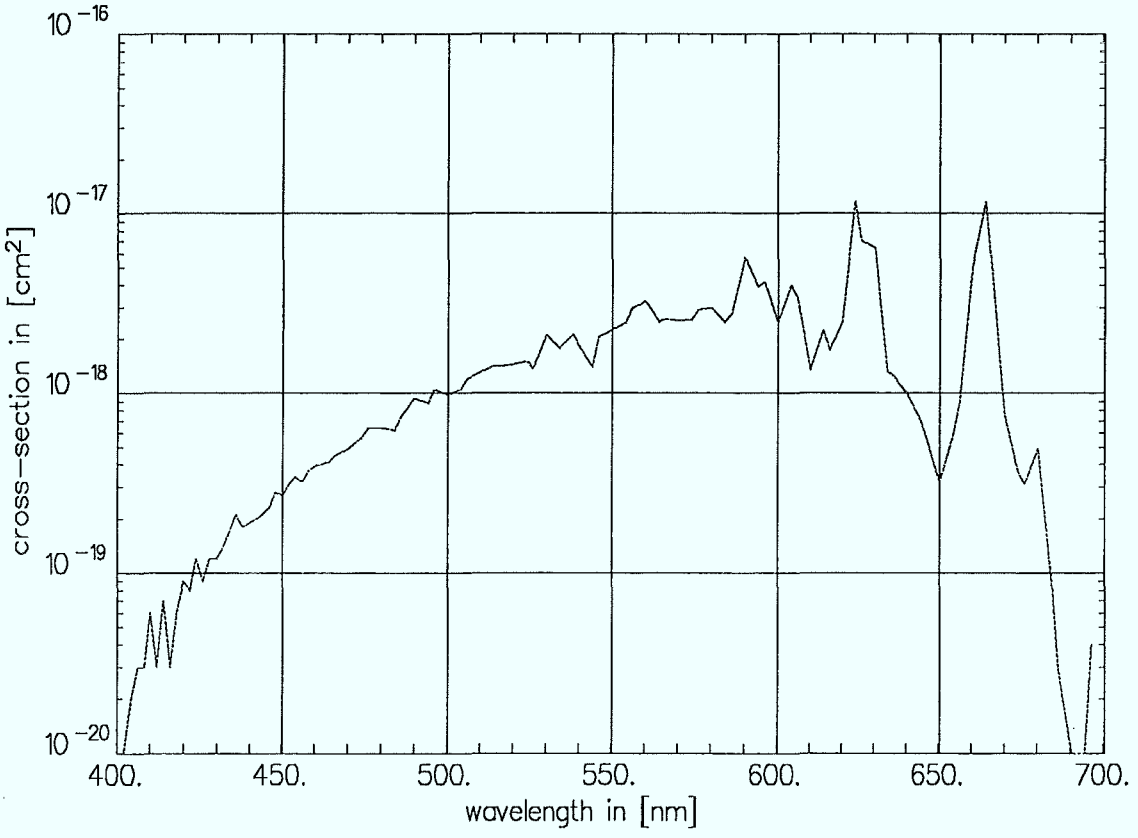
Substance: $NO_3$

Reference:
NASA, Chlorofluoromethanes and the Stratosphere, NASA Reference Publication 1010 (1977), 32

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **$NO_3$**

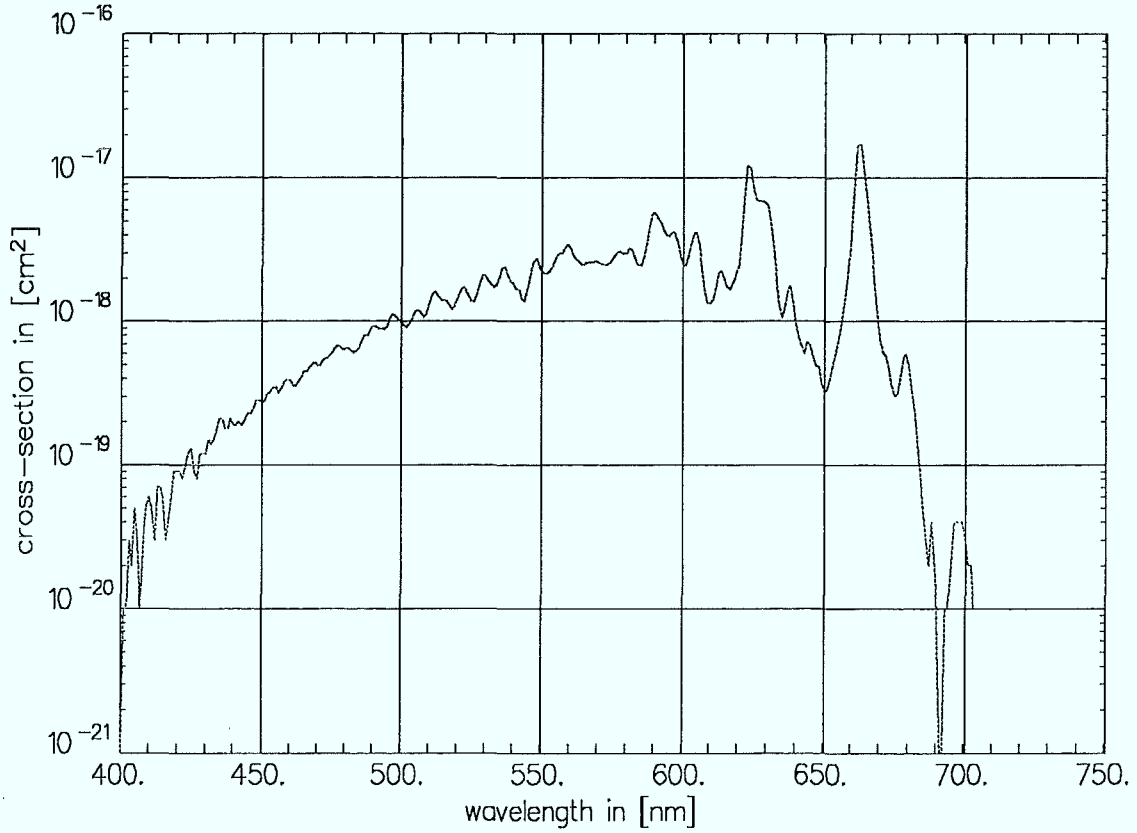
Reference:
Graham, R.A., and H.S. Johnston, The Photochemistry of $NO_3$ and the Kinetics of the $N_2O_5$-$O_3$ System, J. Phys. Chem., **82** (1978), 254-268

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: $NO_3$ was produced from a $NO_2/O_3$ mixtures



Substance: **$NO_3$**

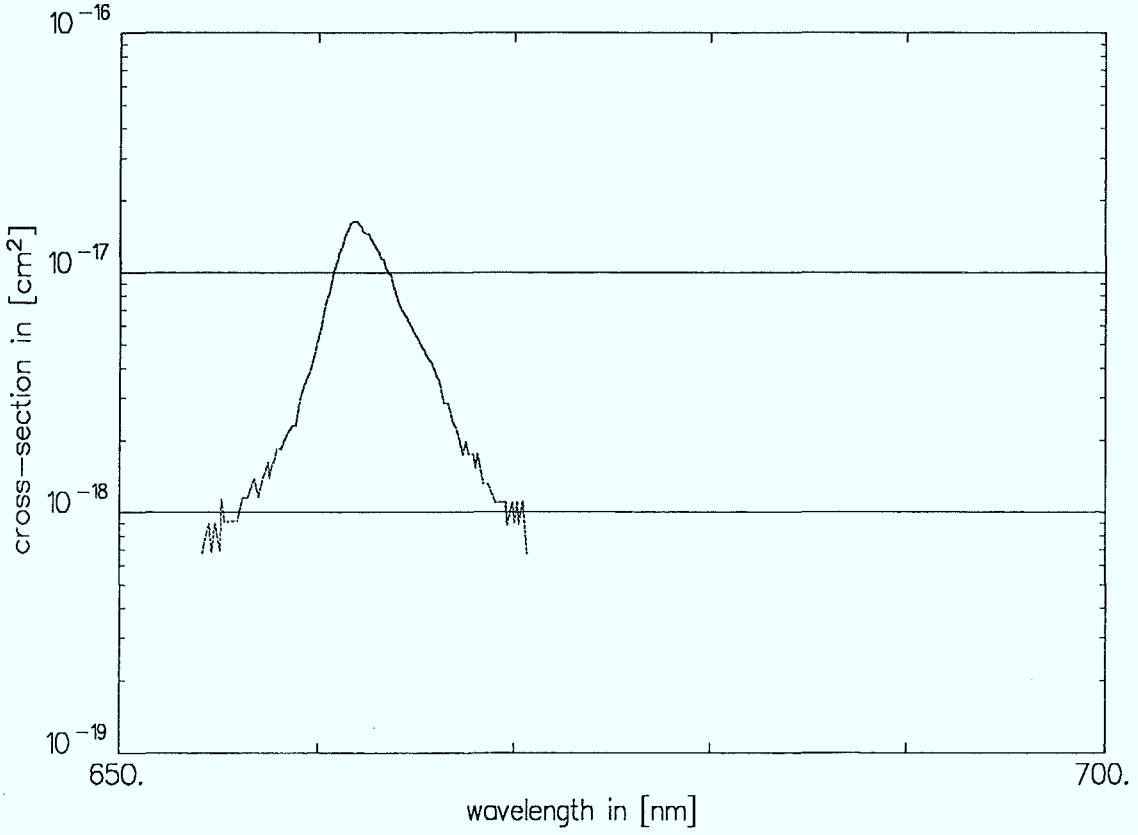
Reference:
Marinelli, W.J., D.M. Swanson, and H.S. Johnston, Absorption Cross Sections and Line Shapes for the $NO_3$(0-0) Band, J. Chem. Phys., **76** (1982), 2864-2870

Data: diagram

Temperature: 296. K

Temperature dependence: no

Comment: $NO_3$ was produced from a $NO_2/O_3$ mixtures



Substance: $NO_3$

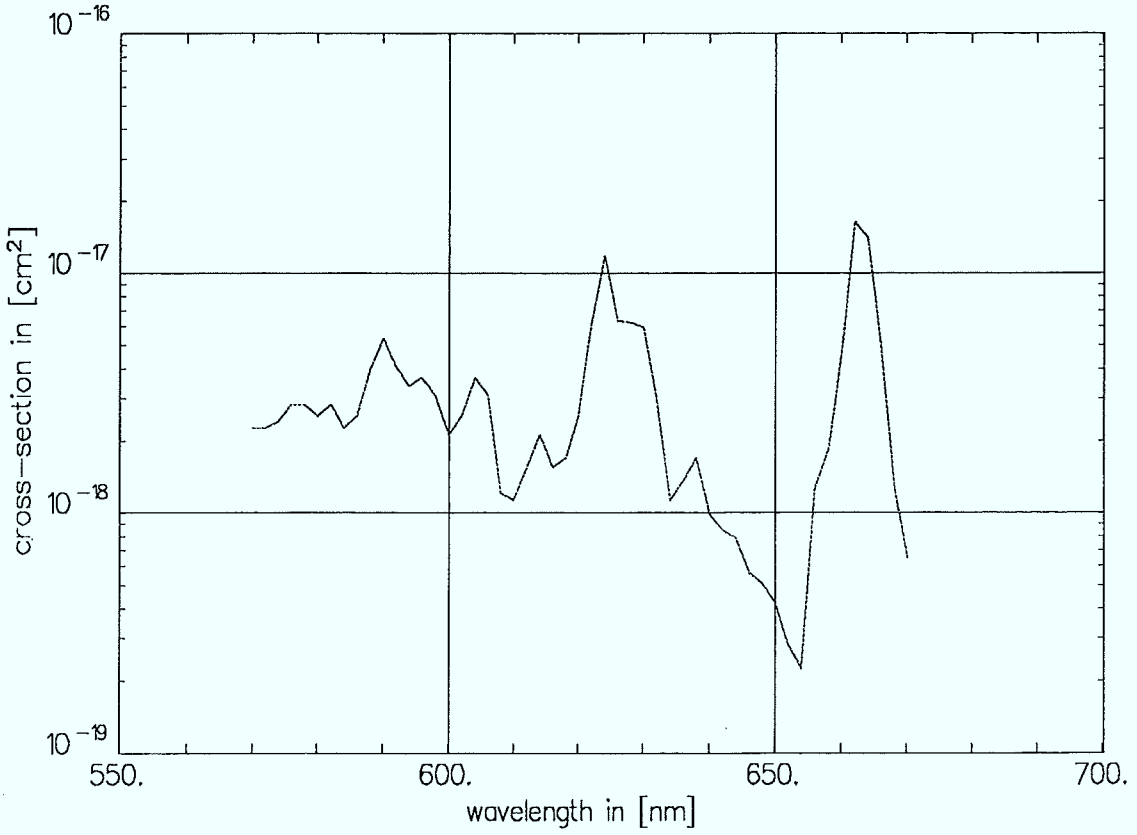
Reference:
Ravishankara, A.R., and P.H. Wine, Absorption Cross Sections for $NO_3$ between 565 and 673 nm, Chem. Phys. Lett., **101** (1983), 73-78

Data: diagram

Temperature: 298. K

Temperature dependence: no

Comment: $NO_3$ was prepared by reacting F atoms with $HNO_3$.



Substance: $NO_3$

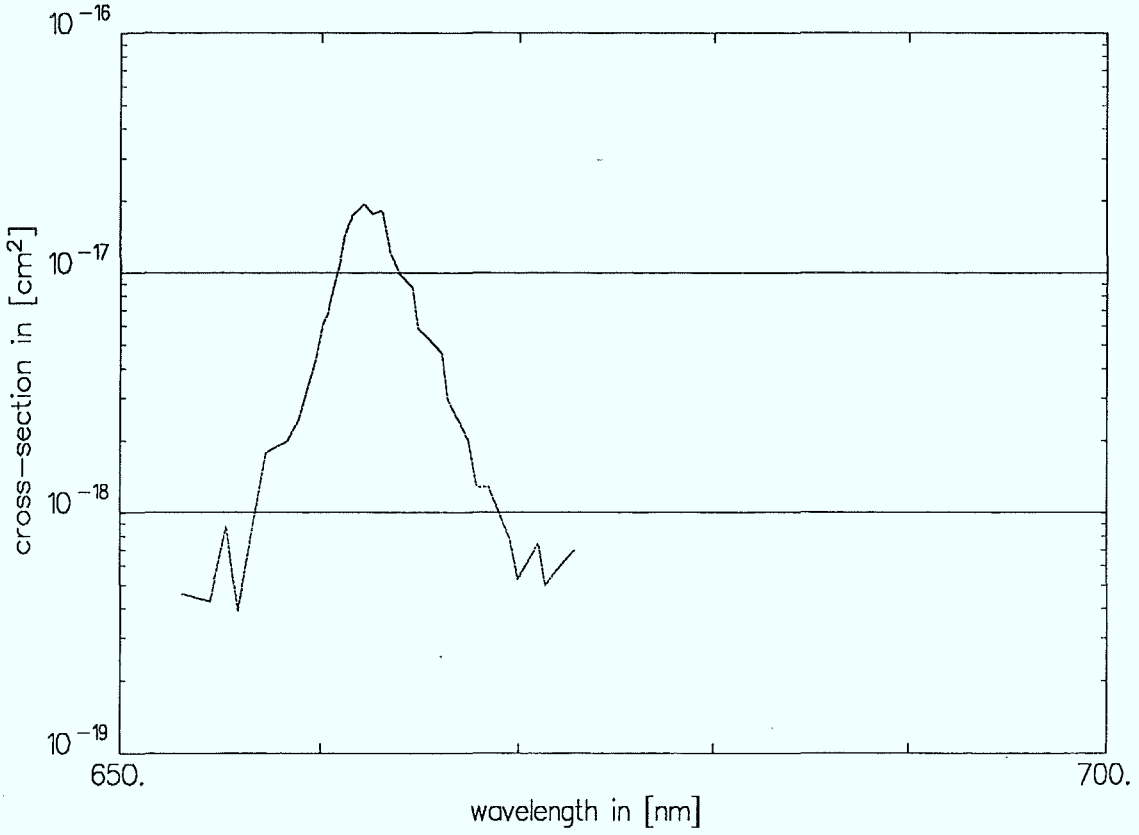
Reference:
Ravishankara, A.R., and R.L. Mauldin III, Temperature Dependence of the $NO_3$ Cross Section in the 662-nm Region, J. Geophys. Res., **91** (1986), 8709-8712

Data: diagram

Temperature: 298. K

Temperature dependence: no

Comment: $NO_3$ was prepared via the F + $HNO_3$ reaction.



Substance: **$NO_3$**

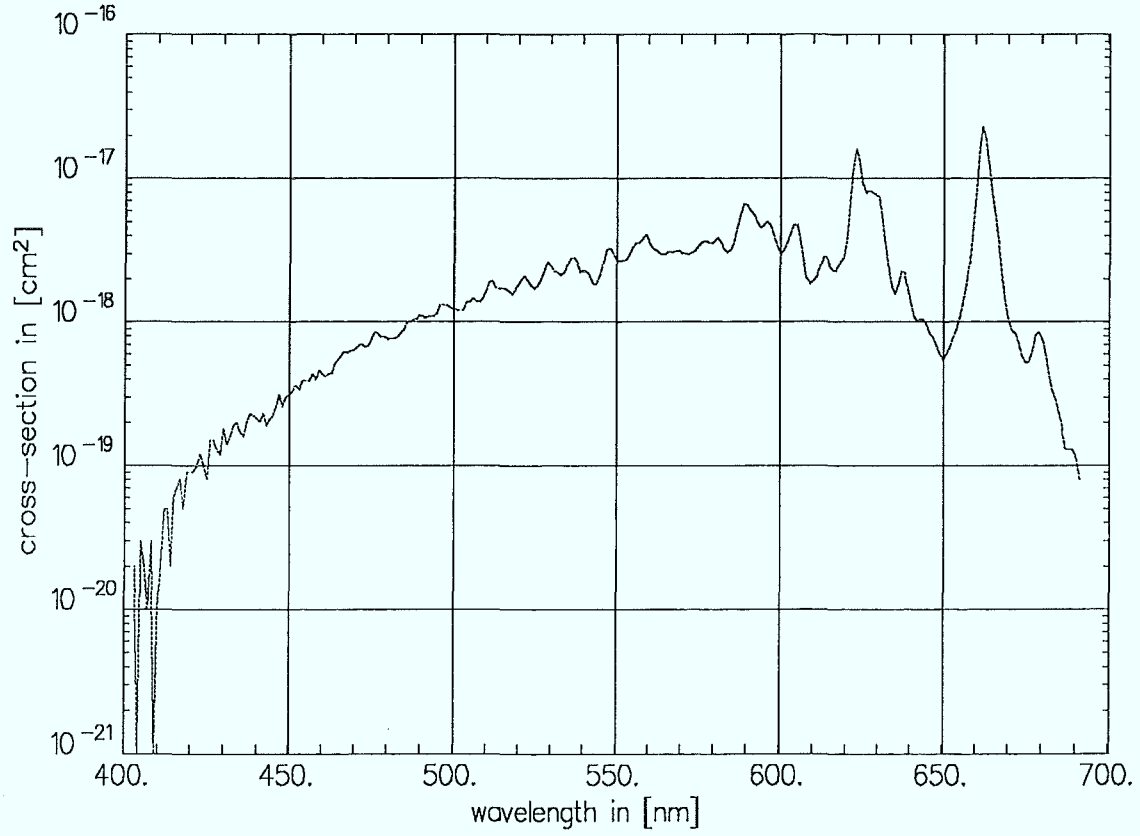
Reference:
Sander, S.P., Temperature Dependence of the $NO_3$ Absorption Spectrum, J. Phys. Chem., **90** (1986), 4135-4142

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: 298. / 230. K

Comment: $NO_3$ was produced from the photolysis of $Cl_2/ClONO_2$ mixtures.

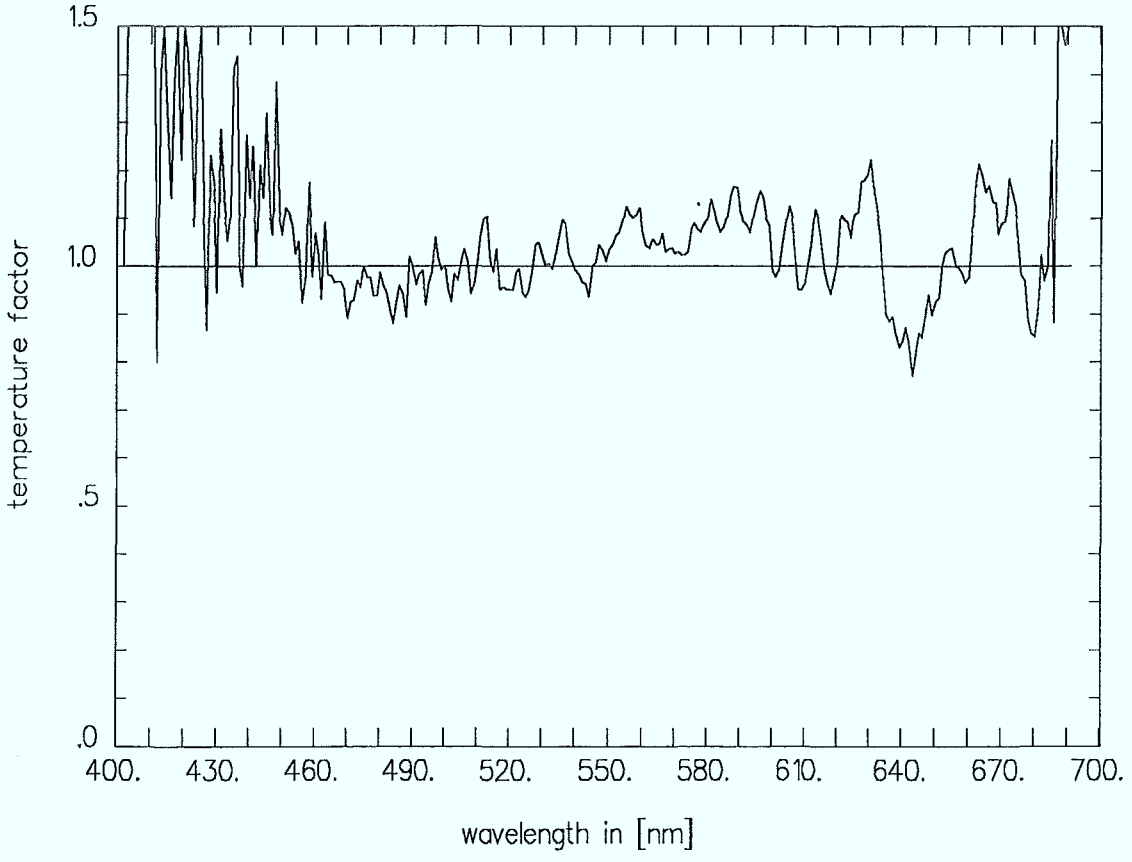


Substance: $NO_3$

Reference:
Sander, S.P., Temperature Dependence of the $NO_3$ Absorption Spectrum, J. Phys. Chem., **90** (1986), 4135-4142

Temperatures: 298. / 230. K

Function: not fitted



Substance: **$NO_3$**

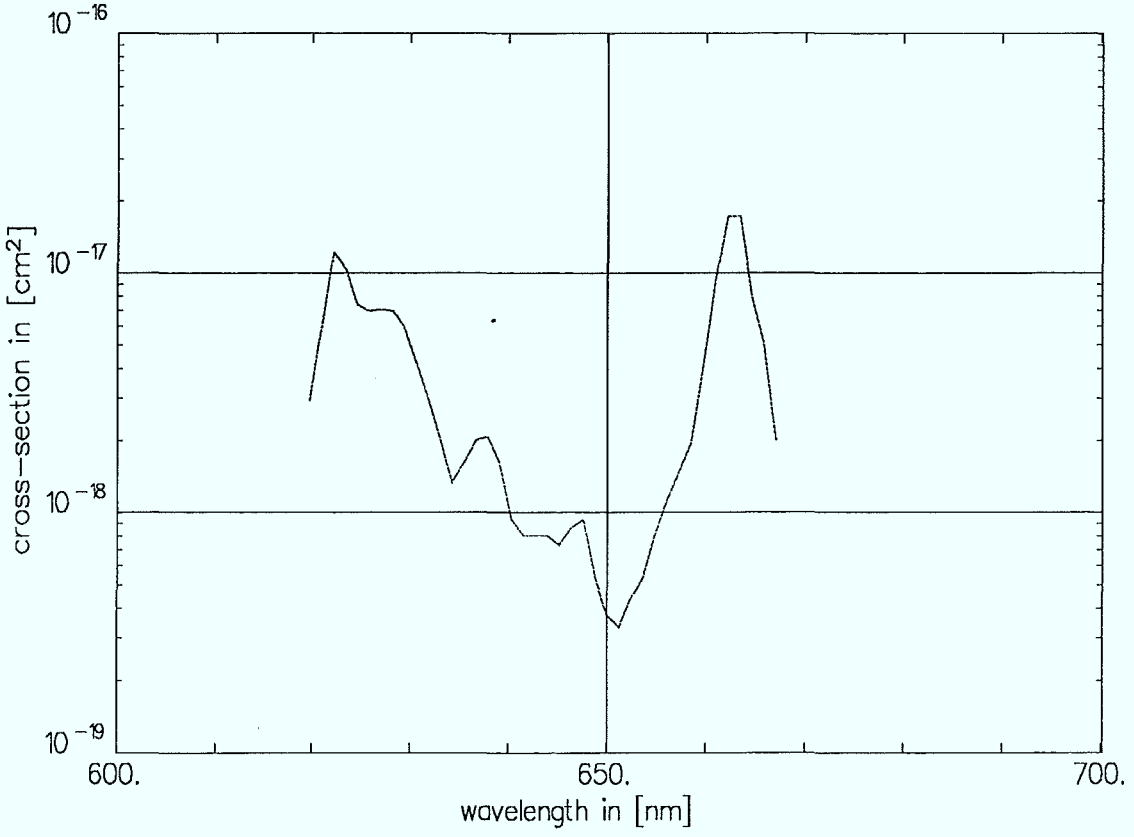
Reference:
Burrows, J.P., G.S. Tyndall, and G.K. Moortgat, Absorption Spectrum of $NO_3$ and Kinetics of the Reaction of $NO_3$ with $NO_2$, Cl, and Several Stable Atmospheric Species at 298 K, J. Phys. Chem., **89** (1989), 4848-4856

Data: diagram

Temperature: 298. K

Temperature dependence: no

Comment: $NO_3$ was produced from the photolysis of $Cl_2/ClONO_2$ or $F_2/HNO_3$ mixtures.



Photolysis: $NO_3$ -> $NO_2$ + O
-> NO + $O_2$

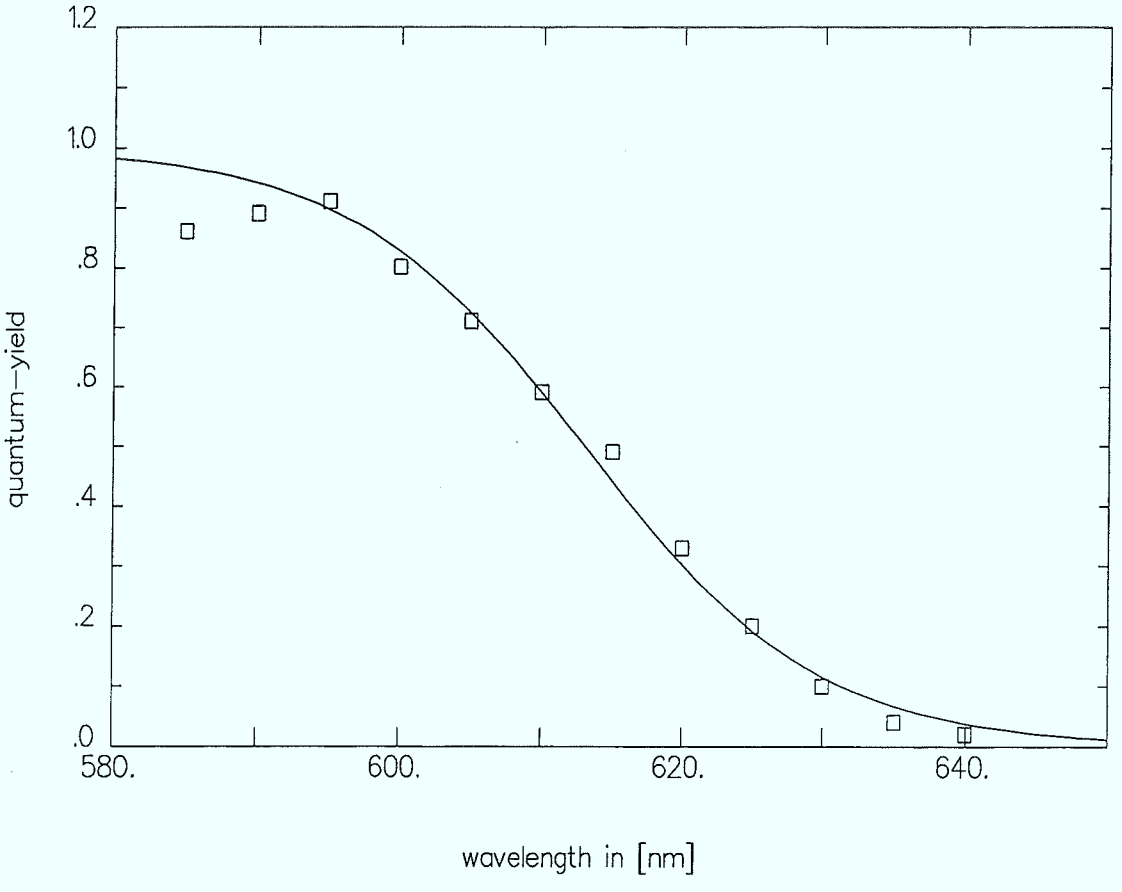
Reference:
Magnotta, F., and H.S. Johnston, Photodissociation Quantum-Yields for the $NO_3$ Free Radical, Geophys. Res. Lett., 7 (1980), 769-772

Data: diagram

Temperature: 296. K Pressure: 10 Torr

Function: 2

Fit Parameter: A = 1 B = 0.12 $\lambda_1$ = 613.



Photolysis: $NO_3$ -> NO + $O_2$

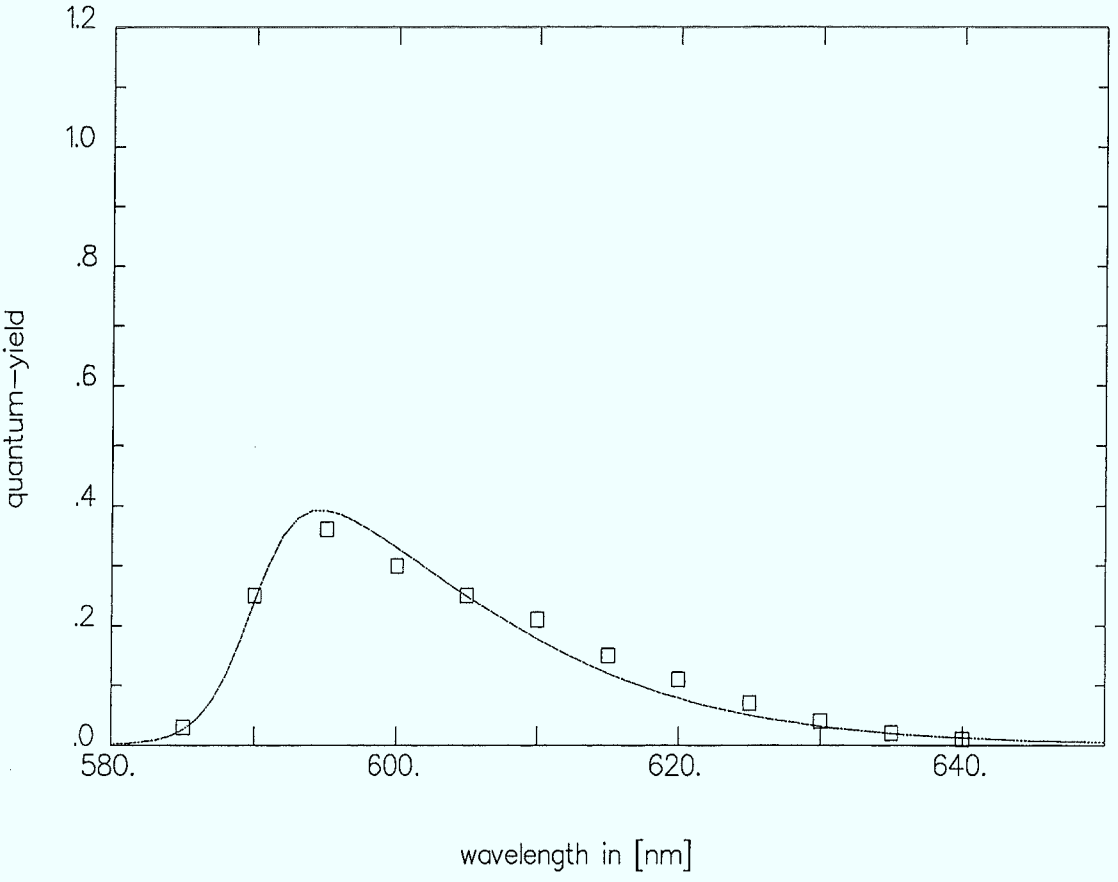
Reference:
Magnotta, F., and H.S. Johnston, Photodissociation Quantum-Yields for the $NO_3$ Free Radical, Geophys. Res. Lett., 7 (1980), 769-772

Data: diagram

Temperature: 296. K Pressure: 10 Torr

Function: 5

Fit Parameter: A = 0.66 B = 0.1 $\lambda_1$ = 600.
C = 1. D = 0.6 $\lambda_2$ = 590.



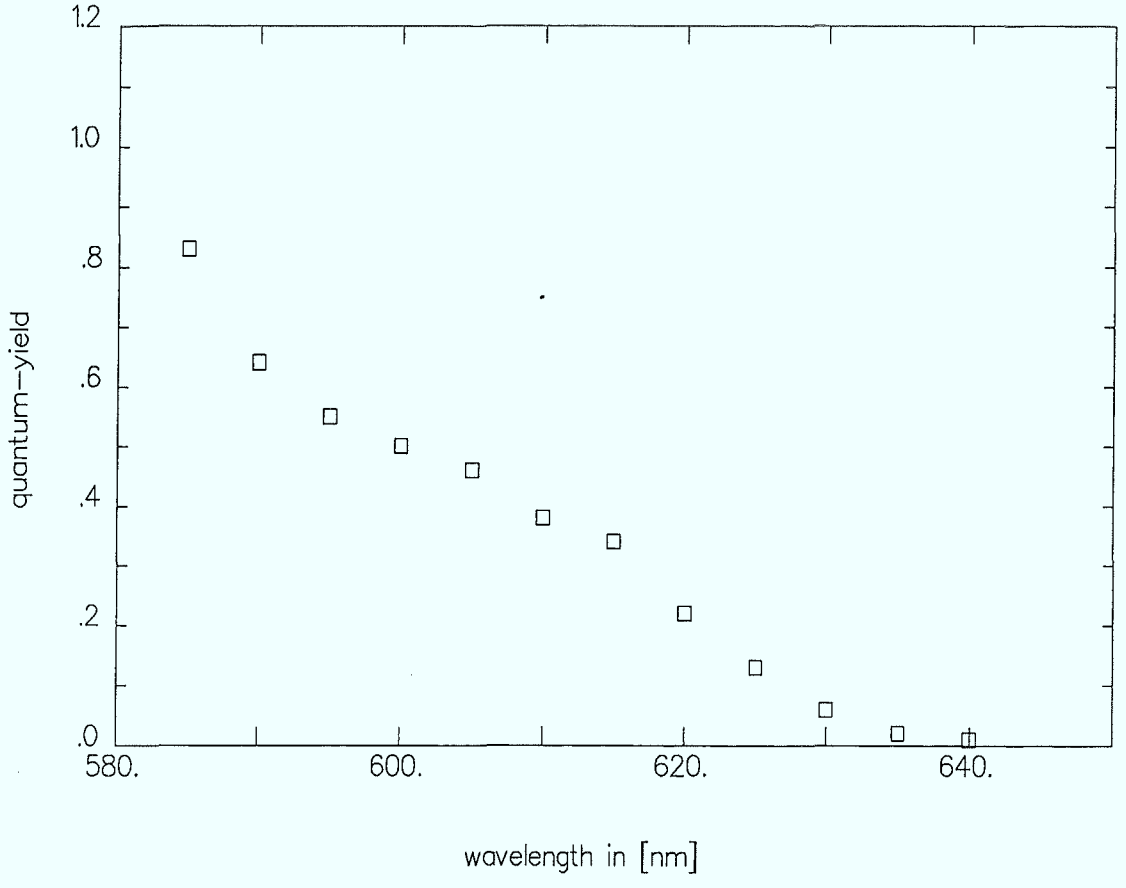
Photolysis: $NO_3 \rightarrow NO_2 + O$

Reference:
Magnotta, F., and H.S. Johnston, Photodissociation Quantum-Yields for the $NO_3$ Free Radical, Geophys. Res. Lett., 7 (1980), 769-772

Data: diagram

Temperature: 296. K Pressure: 10 Torr

Function: remaining term



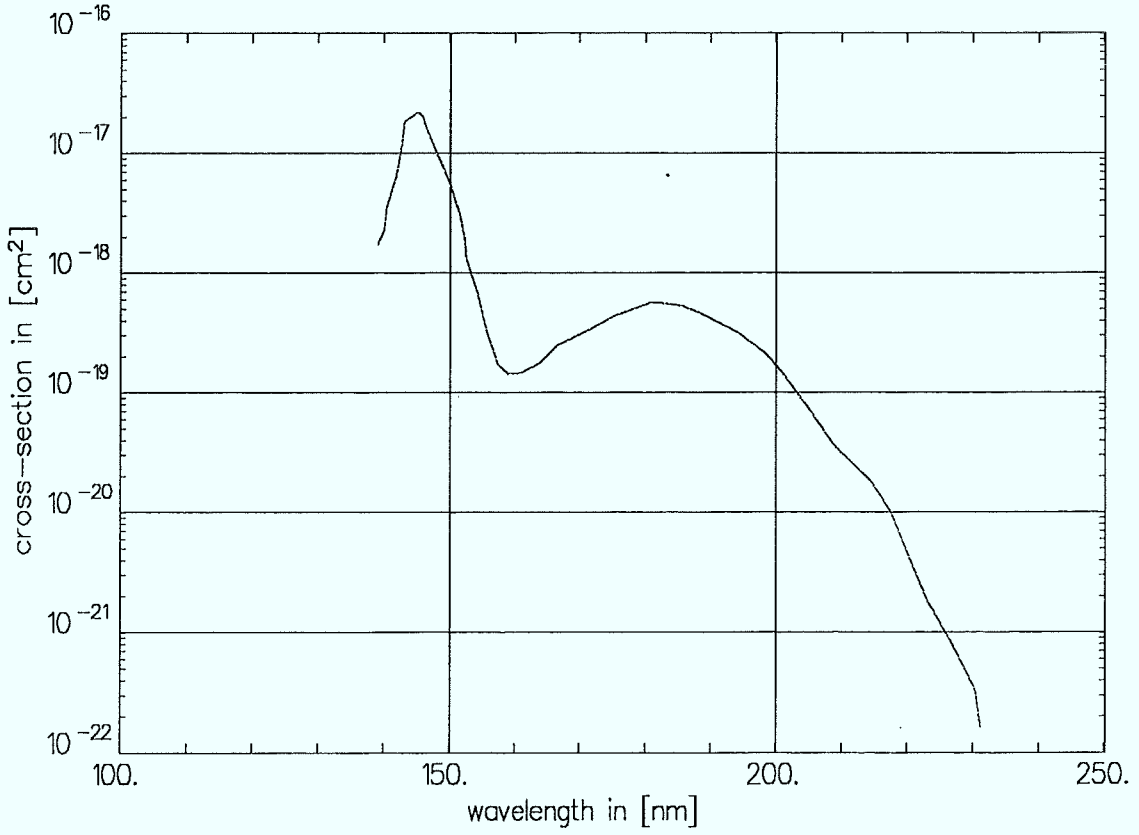
Substance: $N_2O$

Reference:
Romand, J., and J. Mayence, Spectre d'absorption d l'oxide azoteux gazeux dans la région de Schumann, Comptes rendus, **228** (1949), 998-1000

Data: diagram

Temperature: 291. K

Temperature dependence: no



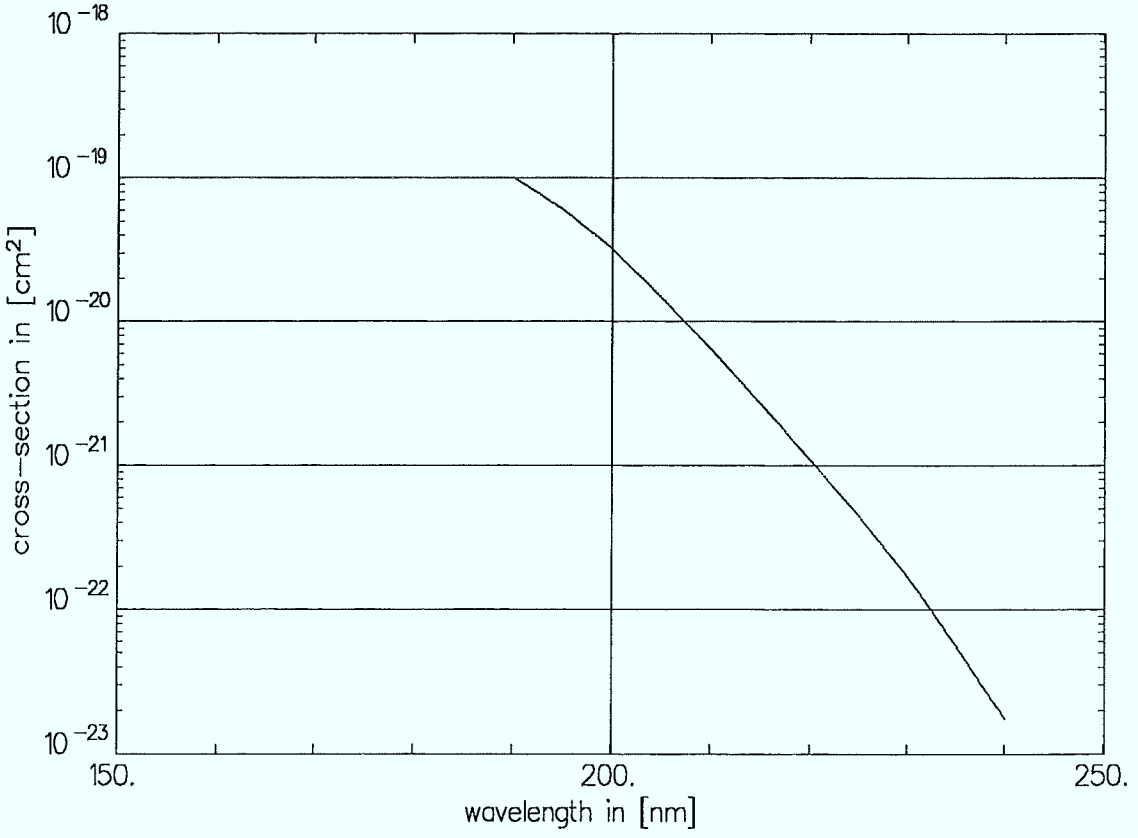
Substance: $N_2O$

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



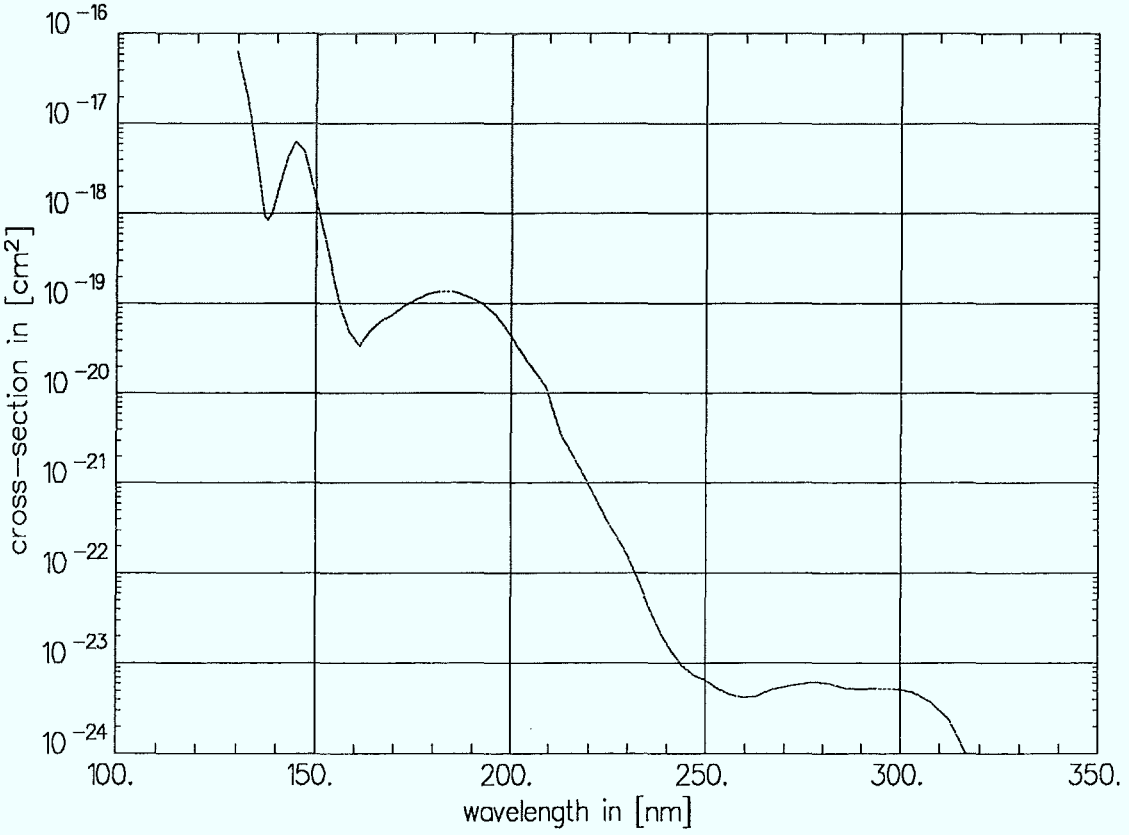
Substance: $N_2O$

Reference:
Nicolet, M., and W. Peetermans, The Production of Nitric Oxide in the Stratosphere by Oxidation of Nitrous Oxide, Ann. Géophys., **28** (1972), 751-762

Data: diagram

Temperature: 298. K

Temperature dependence: no



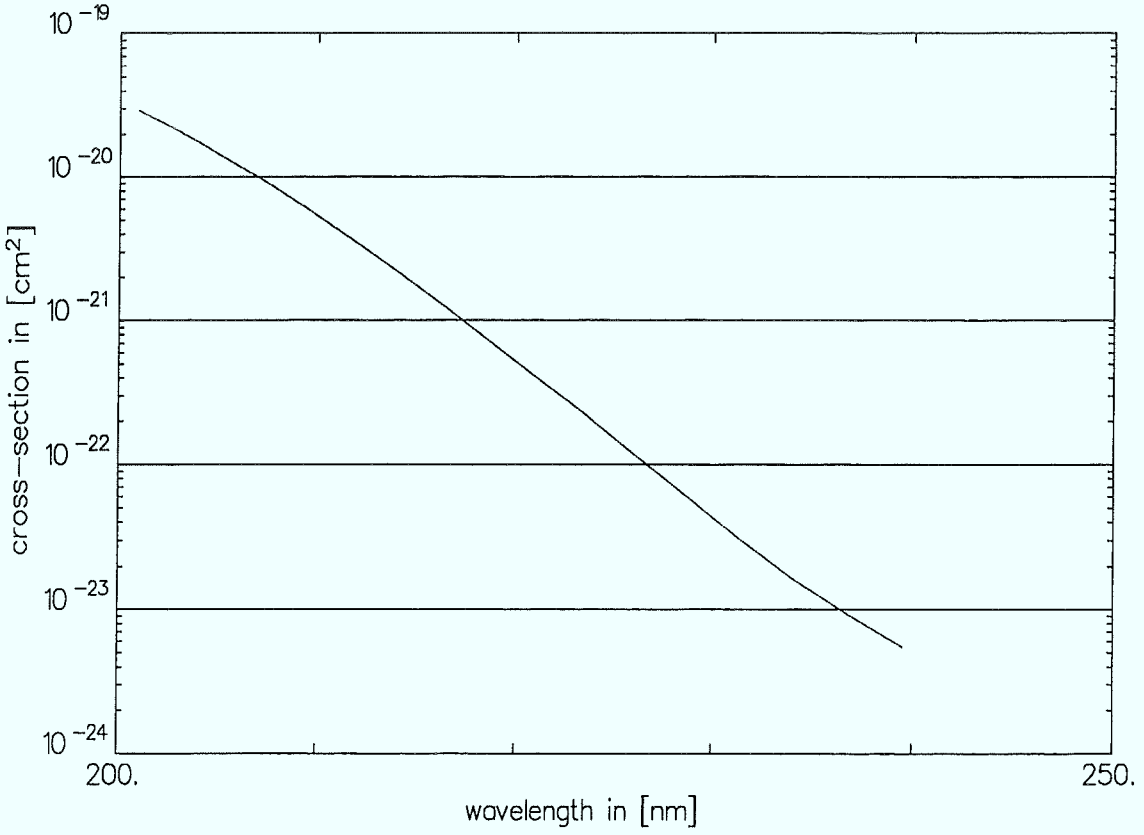
Substance: $N_2O$

Reference:
M. Nicolet, priv. comm., Institut d'Aéronomie Spatiale de Belgique, Brussels, Belgium, 1983

Data: table Resolution: 2.0 - 2.8 nm

Temperature: 250. K

Temperature dependence: no



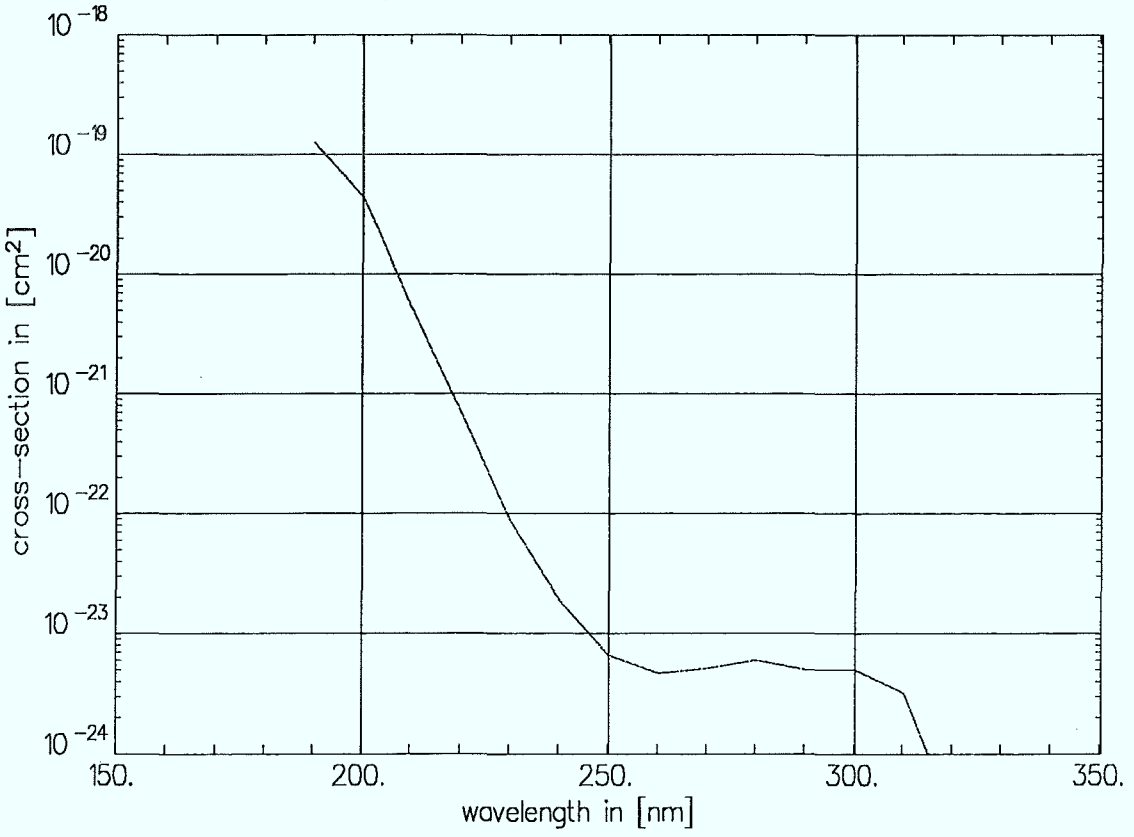
Substance: $N_2O$

Reference:
Johnston, H.S., and R. Graham, Photochemistry of $NO_X$ and $HNO_X$ Compounds, Can. J. Chem., **52** (1975), 1415-1423

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



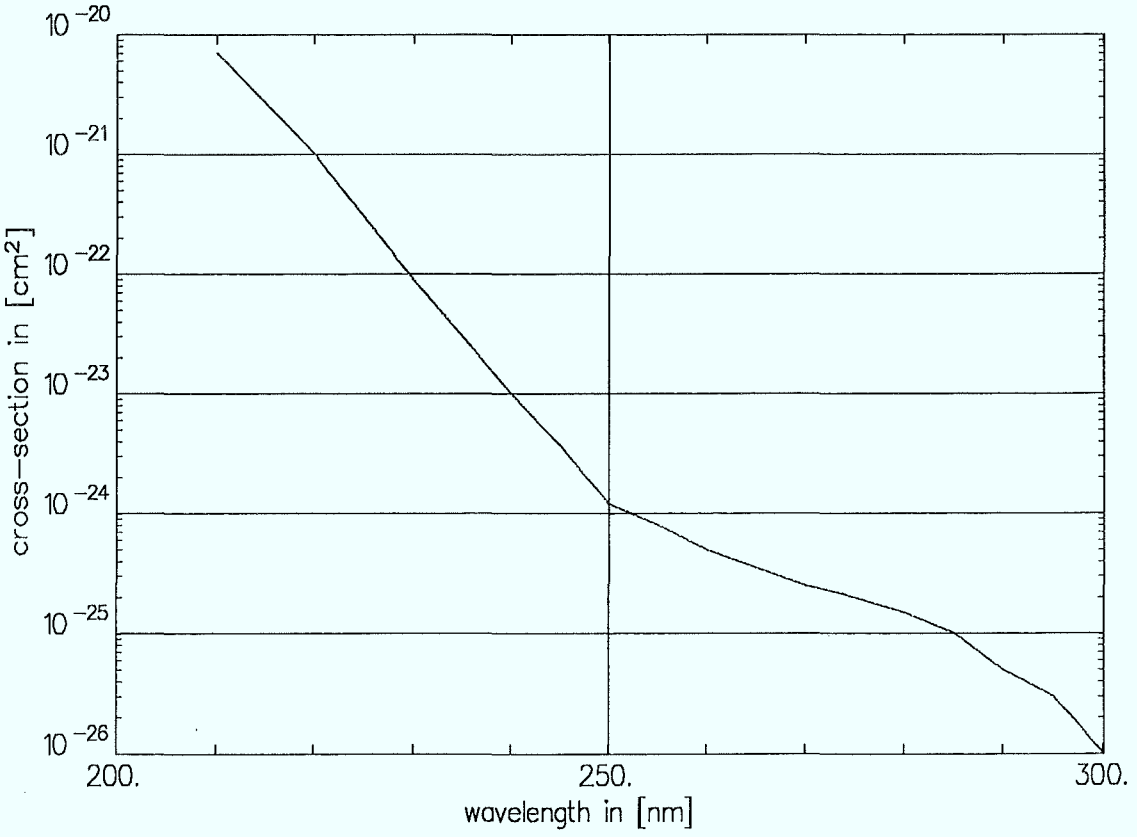
Substance: $N_2O$

Reference:
Johnston, H.S., and G.S. Selwyn, New Cross Sections for the Absorption of Near Ultraviolet Radiation by Nitrous Oxide ($N_2O$), Geophys. Res. Lett., 2 (1975), 549-551

Data: diagram

Temperature: 298. K

Temperature dependence: no



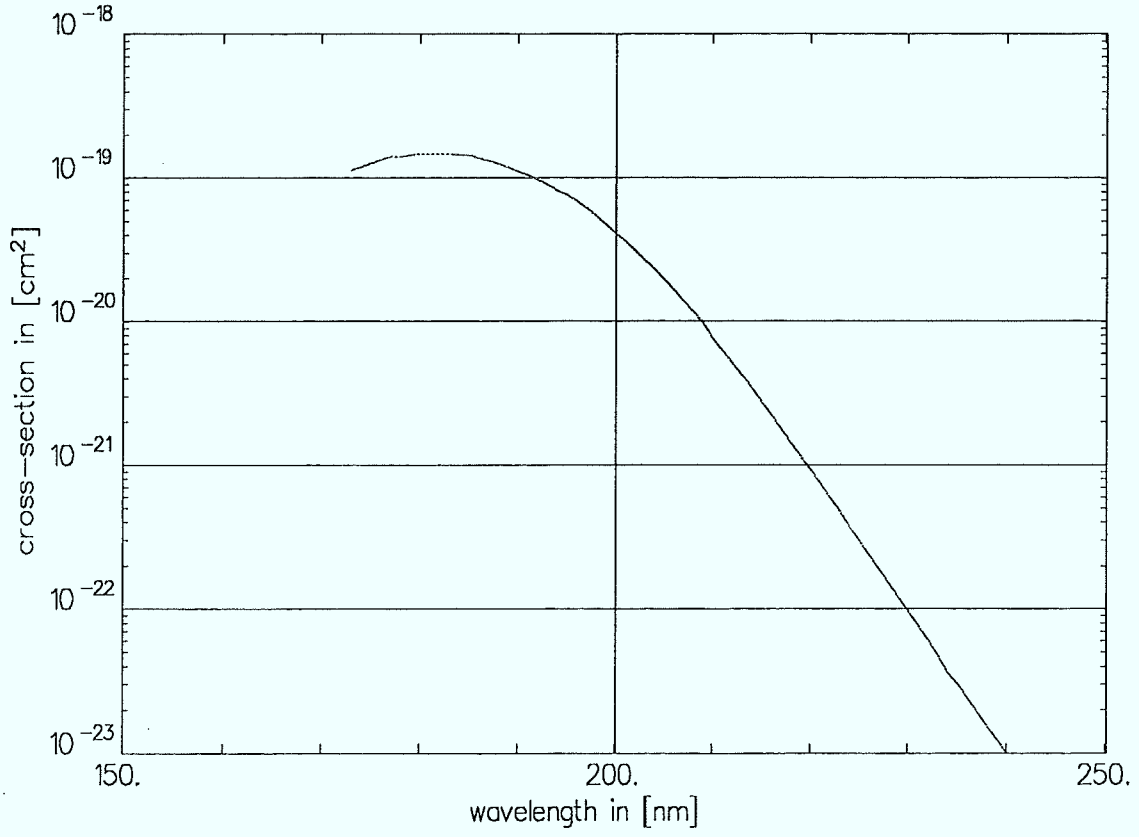
Substance: $N_2O$

Reference:
Selwyn, G., J. Podolske, and H.S. Johnston, Nitrous Oxide Ultraviolet Absorption Spectrum at Stratospheric Temperatures, Geophys. Res. Lett., **4** (1977), 427-430

Data: table Resolution: 1.0 nm

Temperature: 302. K

Temperature dependence: 302. / 263. / 243. / 225. / 194. K



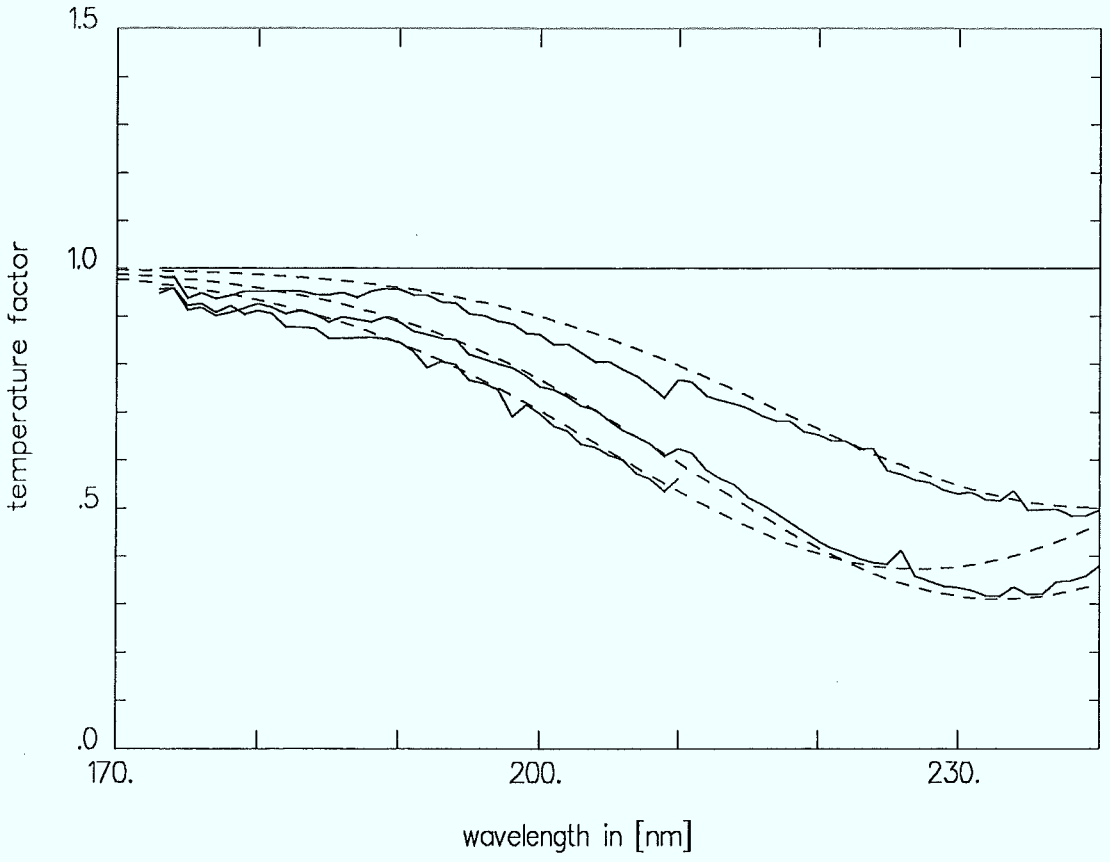
Substance: $N_2O$

Reference:
Selwyn, G., J. Podolske, and H.S. Johnston, Nitrous Oxide Ultraviolet Absorption Spectrum at Stratospheric Temperatures, Geophys. Res. Lett., 4 (1977), 427-430

Temperatures: 302. / 263. / 225. / 194. K

Function: 2

| Fit Parameter: | a = | 1.678E-2 | b = | -1.016E-4 | c = | -1.E-3 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 191.608 | f = | 0.184 |



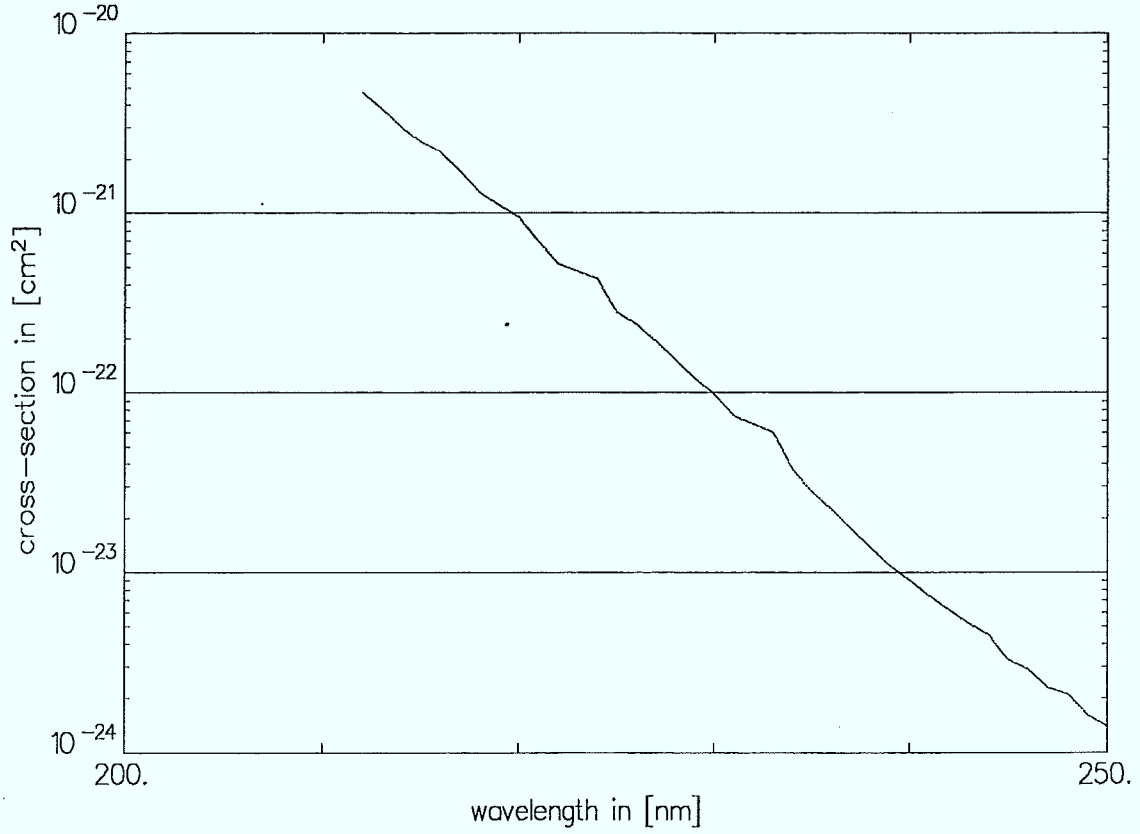
Substance: $N_2O$

Reference:
Sundararaman, N., Summary of Upper Atmospheric Data, FAA-EQ-77-2, 1977

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no



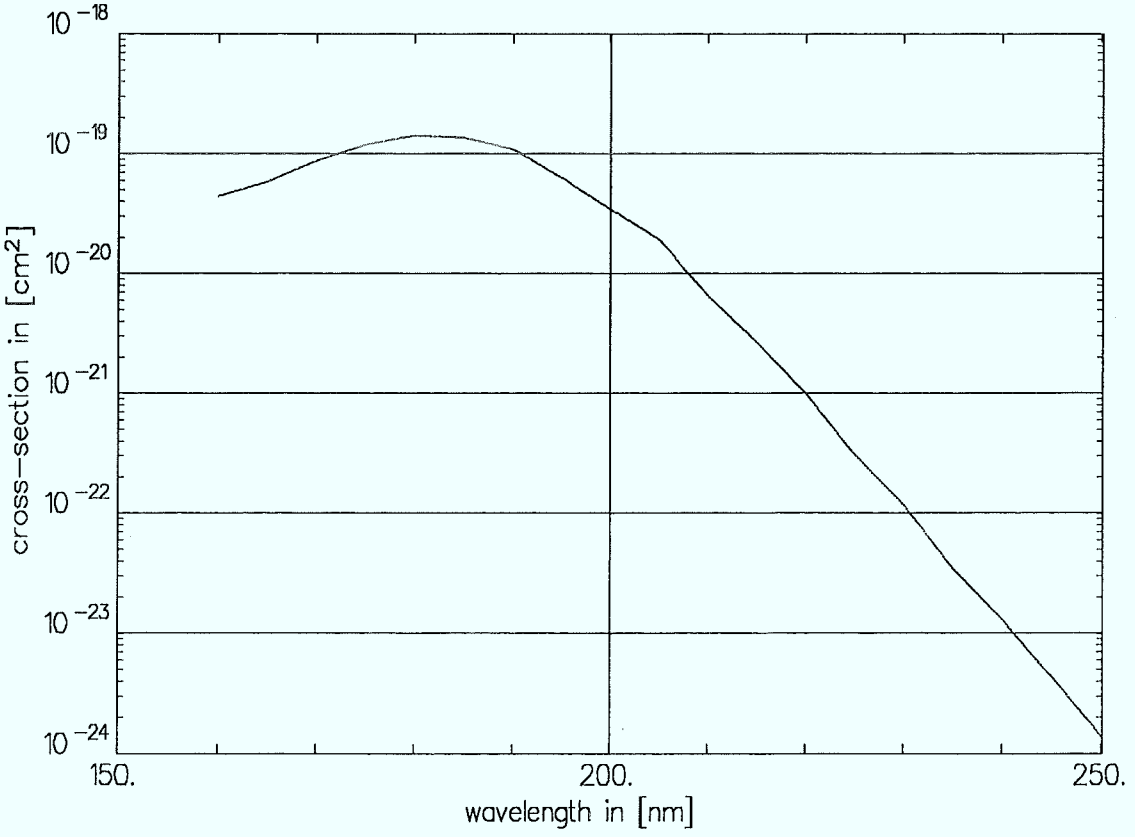
Substance: $N_2O$

Reference:
Hubrich, C., and F. Stuhl, The Ultraviolet Absorption of Some Halogenated Methanes and Ethanes of Atmospheric Interest, J. Photochem., **12** (1980), 93-107

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: 298. / 208. K



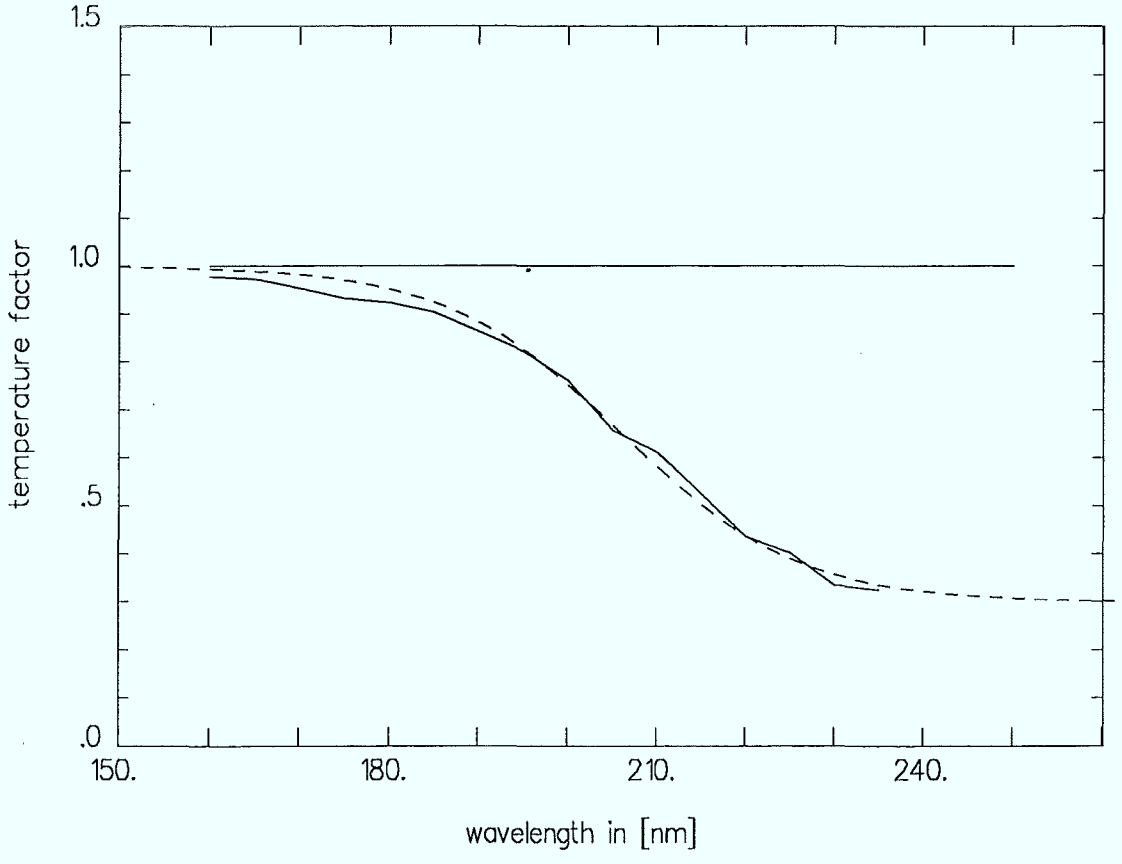
Substance: $N_2O$

Reference:
Hubrich, C., and F. Stuhl, The Ultraviolet Absorption of Some Halogenated Methanes and Ethanes of Atmospheric Interest, J. Photochem., **12** (1980), 93-107

Temperatures: 298. / 208. K

Function: 1

| Fit Parameter: | a = | 1.0 | b = | -7.8E-3 | c = | 0.1 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 206. | f = | 0. |



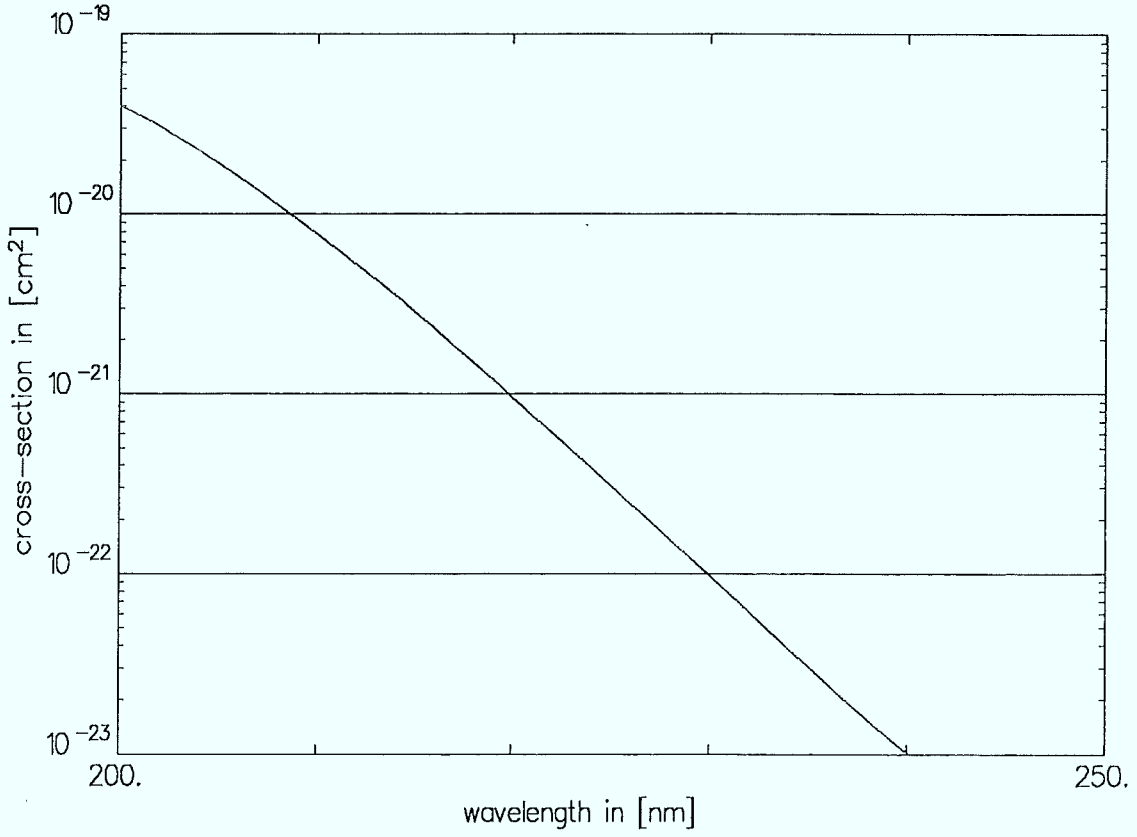
Substance: $N_2O$

Reference:
Merienne, M.F., B. Coquart, and A. Jenouvrier, Temperature Effect on the Ultraviolet Absorption of $CFCl_3$, $CF_2Cl_2$ and $N_2O$, Planet. Space Sci., **38** (1990), 617-625

Data: table Resolution: 1.0 nm

Temperature: 296. K

Temperature dependence: 296. / 240. / 220. K



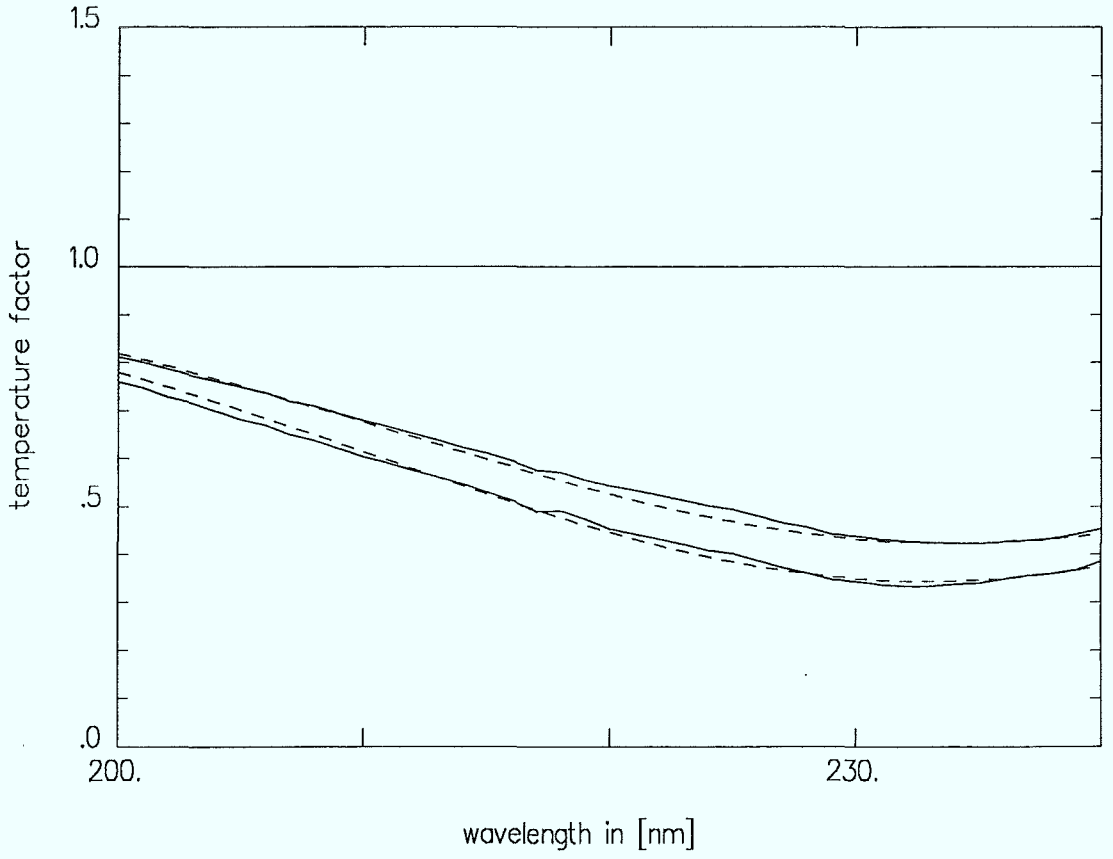
Substance: $N_2O$

Reference:
Merienne, M.F., B. Coquart, and A. Jenouvrier, Temperature Effect on the Ultraviolet Absorption of $CFCl_3$, $CF_2Cl_2$ and $N_2O$, Planet. Space Sci., **38** (1990), 617-625

Temperatures: 296. / 240. / 220. K

Function: 2

| Fit Parameter: | a = | 1.5E-2 | b = | -8.365E-5 | c = | -1.E-3 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 222. | f = | 0.05 |



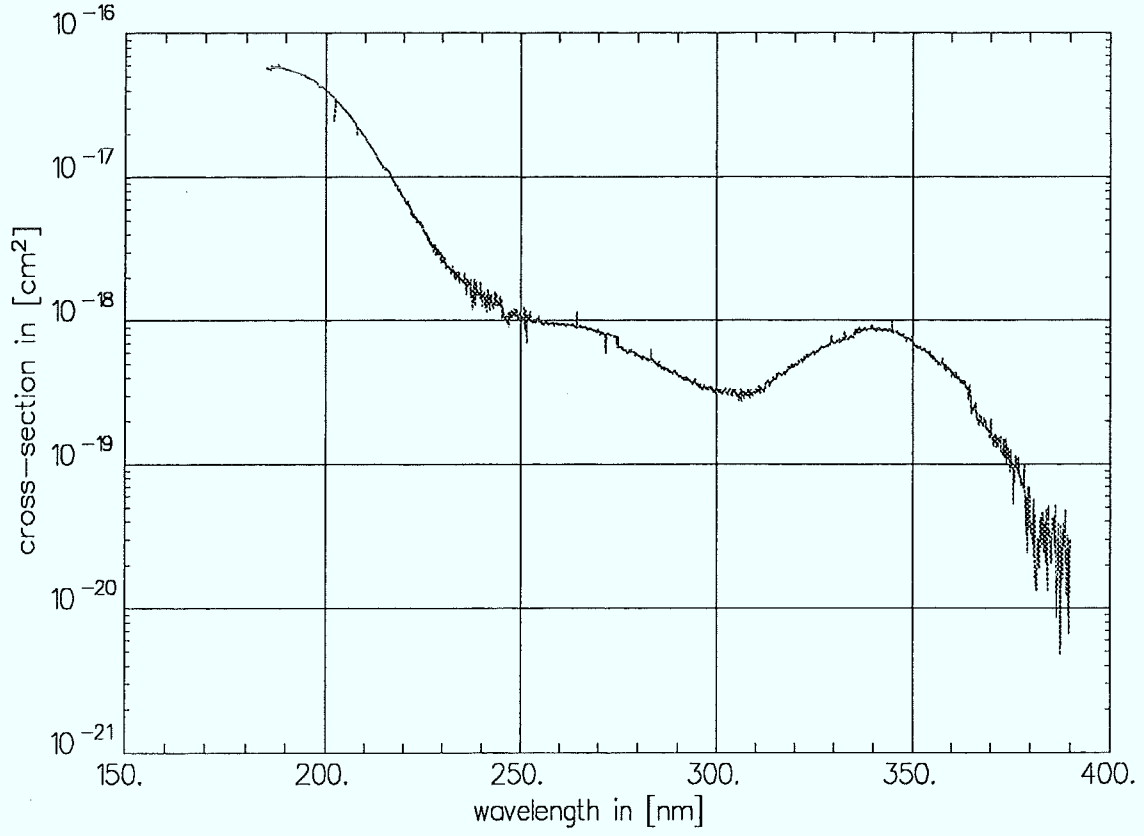
Substance: $N_2O_4$

Reference:
Bass, A.M., A.E. Ledford, Jr., and A.H. Lauffer, Exrinction Coefficients of $NO_2$ and $N_2O_4$, J. Res. NBS, **80A** (1976), 143-166

Data: table Resolution: 0.13 nm

Temperature: 273. K

Temperature dependence: no



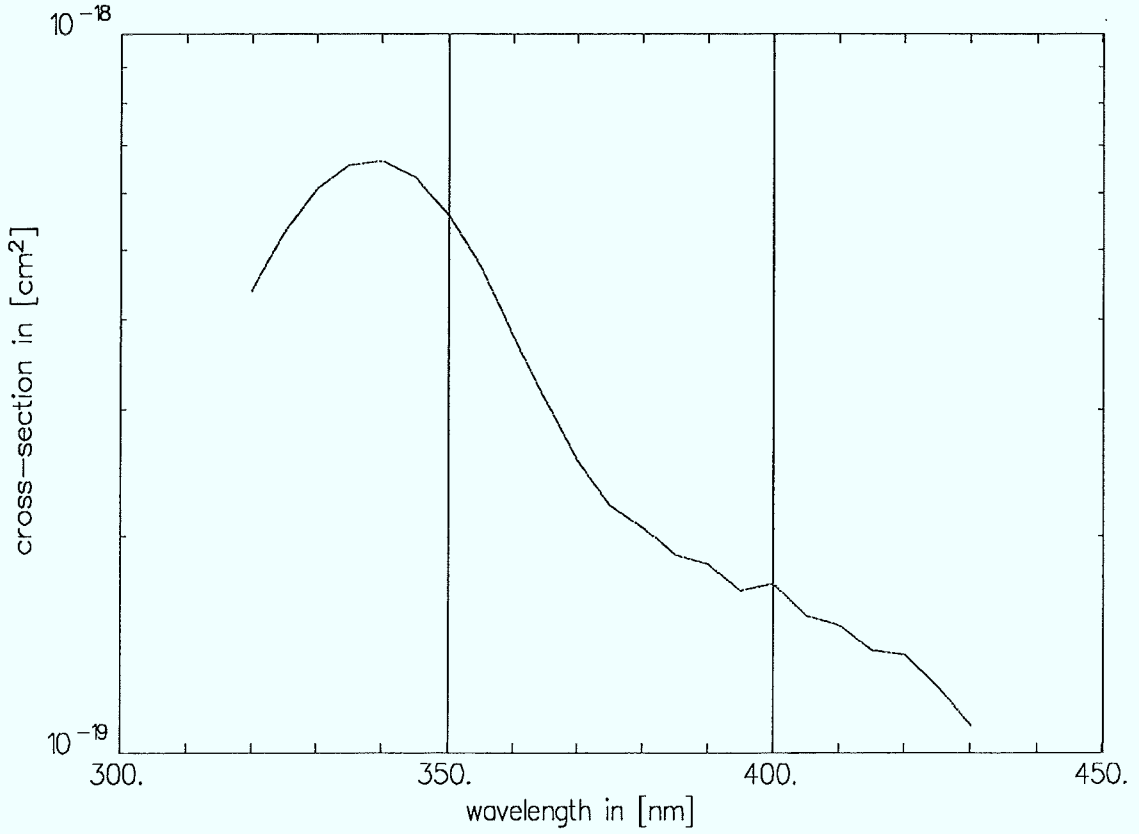
Substance: $N_2O_4$

Reference:
Harwood, M.H., and R.L. Jones, Temperature Dependent Ultraviolet-Visible Absorption Cross Sections of $NO_2$ and $N_2O_4$: Low-Temperature Measurements of the Equilibrium Constant of $2NO_2 <=> N_2O_4$, J. Geophys. Res., **99** (1994), 22955-22964.

Data: table Resolution: 5.0 nm

Temperature: 253. K

Temperature dependence: 253. / 243. / 233. / 225. / 213. K



Substance: $N_2O_4$

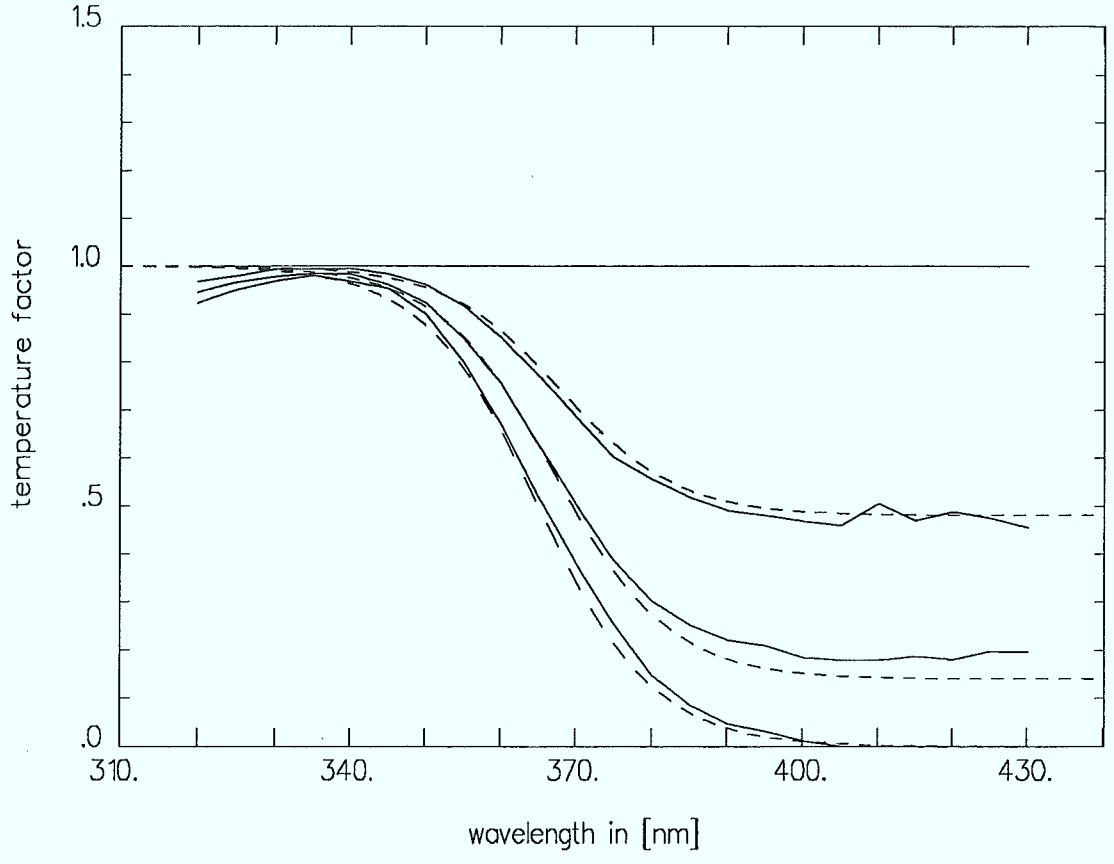
Reference:
Harwood, M.H., and R.L. Jones, Temperature Dependent Ultraviolet-Visible Absorption Cross Sections of $NO_2$ and $N_2O_4$: Low-Temperature Measurements of the Equilibrium Constant of $2NO_2 <=> N_2O_4$, J. Geophys. Res., **99** (1994), 22955-22964.

Temperatures: 253. / 243. / 233. / 213. K

Function: 1

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | -6.1E-2 | b = | 9.0E-4 | c = | 0.13 |
| d = | 0. | e = | 343.7 | f = | 0.1 |



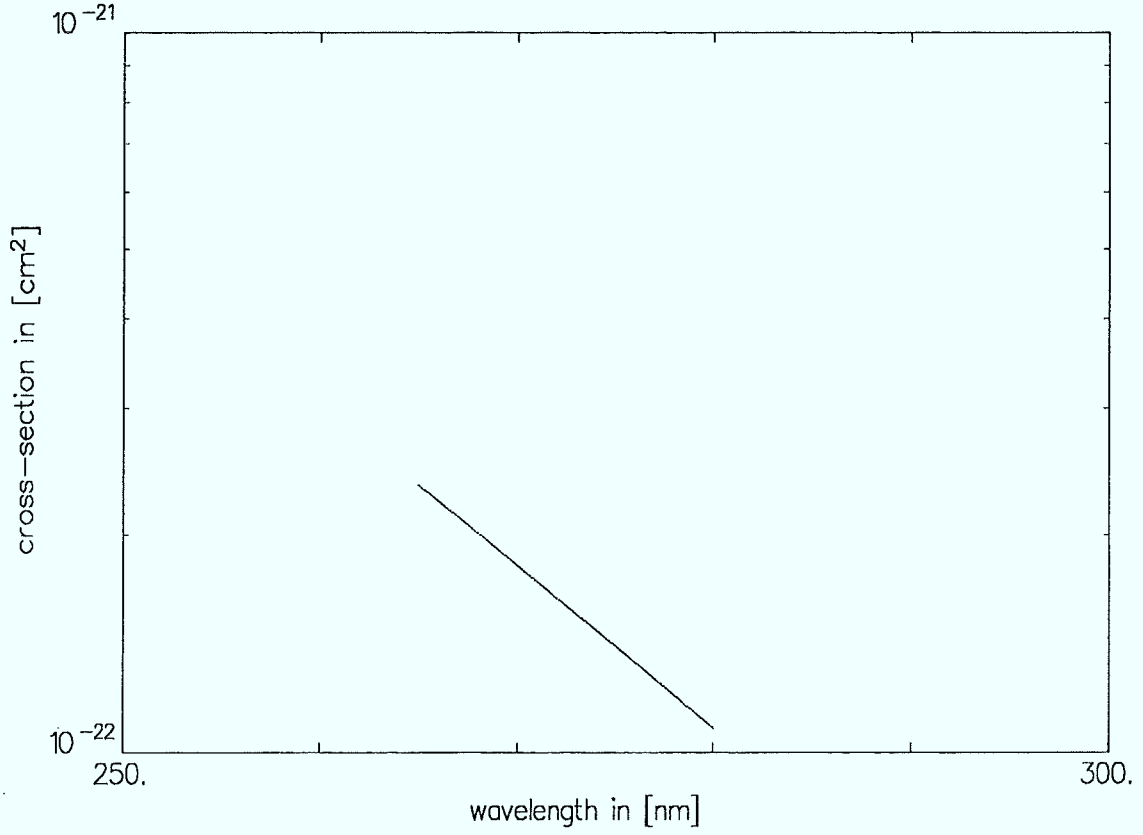
Substance: $N_2O_5$

Reference:
Holmes, H.H., and F. Daniels, The Photolysis of Nitrogen Oxides: $N_2O_5$, $N_2O_4$ and $NO_2$, J. Am. Chem. Soc., **56** (1934), 630-637

Data: table Resolution: 15.0 nm

Temperature: 273. K

Temperature dependence: no



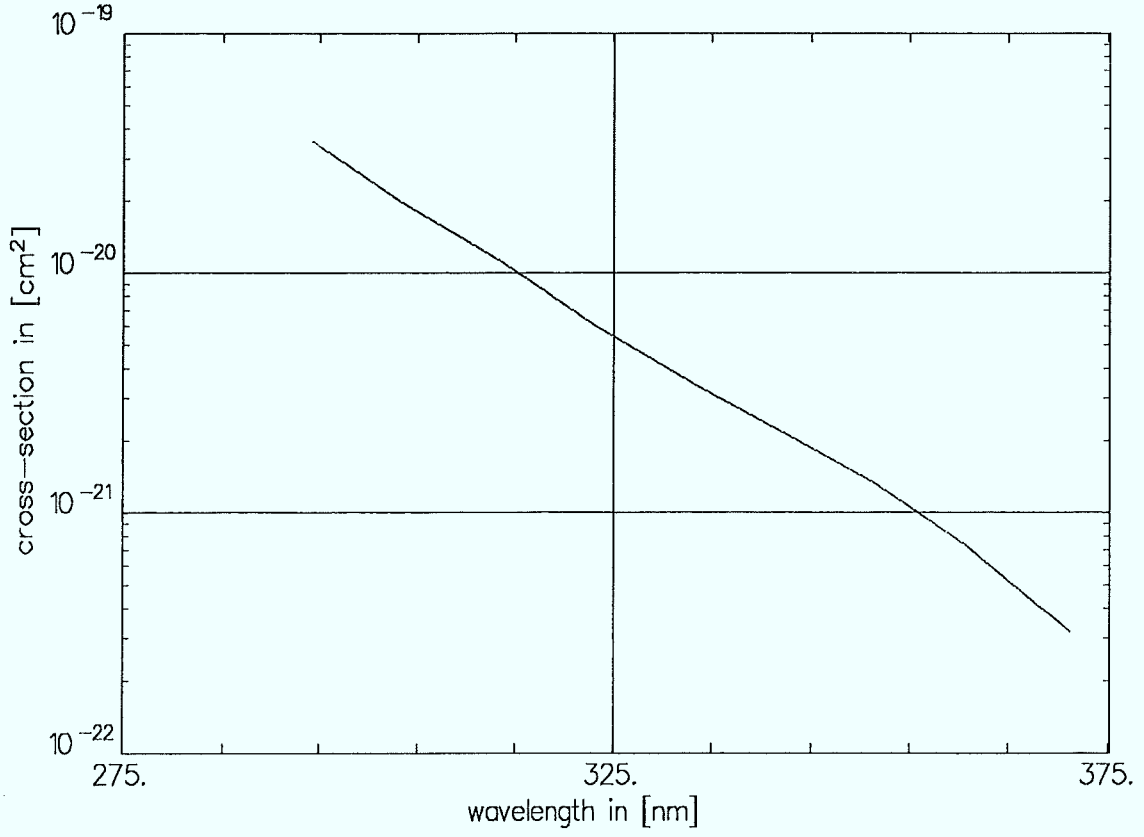
Substance: $N_2O_5$

Reference:
Jones, E.J., and O.R. Wulf, The Absorption Coefficient of Nitrogen Pentoxide in the Ultraviolet and the Visible Absorption Spectrum of $NO_3$, J. Chem. Phys., **5** (1937), 873-877

Data: diagram

Temperature: 273. K

Temperature dependence: no



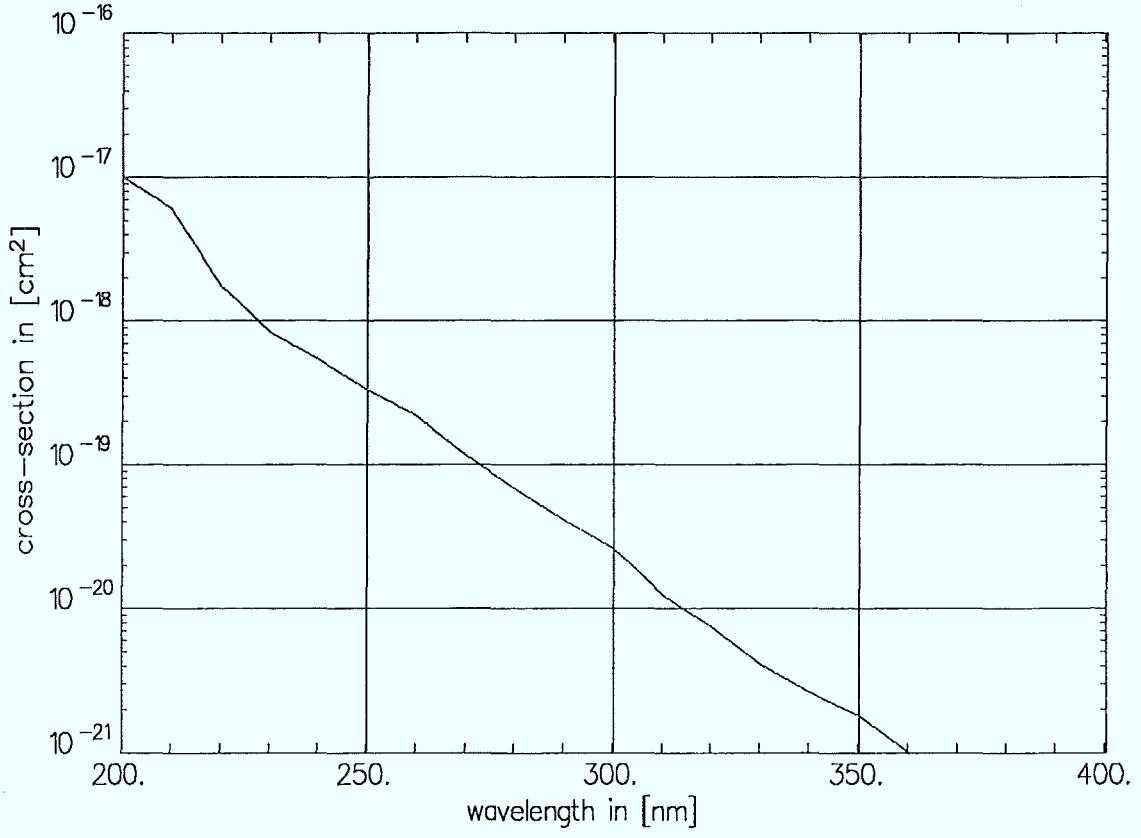
Substance: $N_2O_5$

Reference:
Johnston, H.S., S.-G. Chang, and G. Whitten, Photolysis of Nitric Acid Vapor, J. Phys. Chem., **78** (1974), 1-7

Data: diagram

Temperature: 298. K

Temperature dependence: no



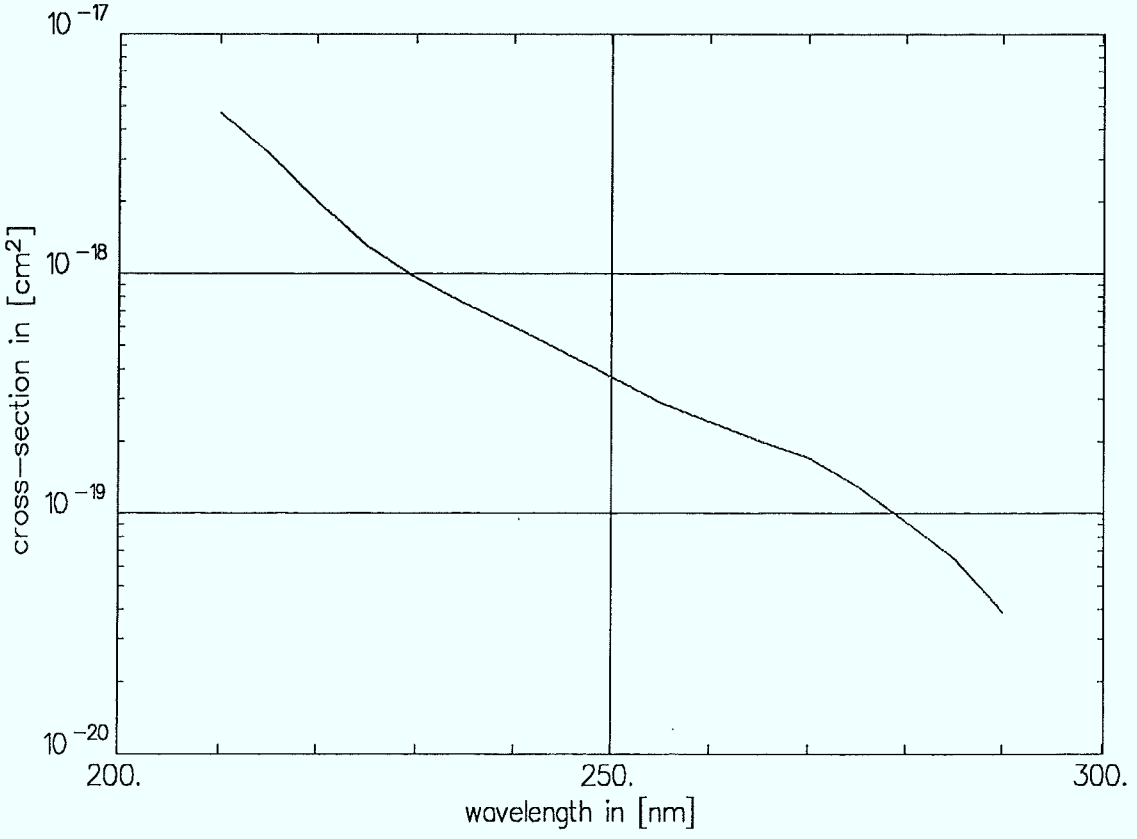
Substance: $N_2O_5$

Reference:
Johnston, H.S., and R. Graham, Photochemistry of $NO_X$ and $HNO_X$ Compounds, Can. J. Chem., **52** (1975), 1415-1423

Data: table Resolution: 5.0 - 10.0 nm

Temperature: 298. K

Temperature dependence: no



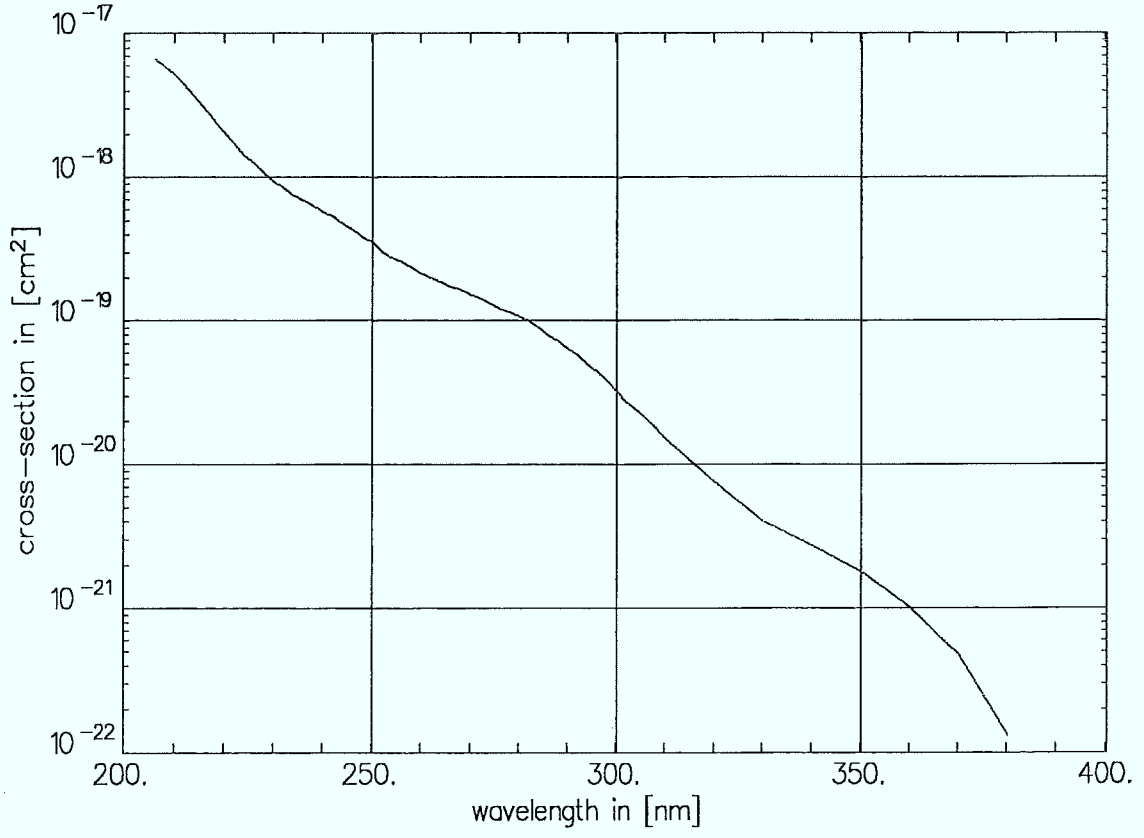
Substance: $N_2O_5$

Reference:
NASA, Chlorofluoromethanes and the Stratosphere, NASA Reference Publication 1010 (1977), 34

Data: table Resolution: 1.0 - 10.0 nm

Temperature: 295. K

Temperature dependence: no



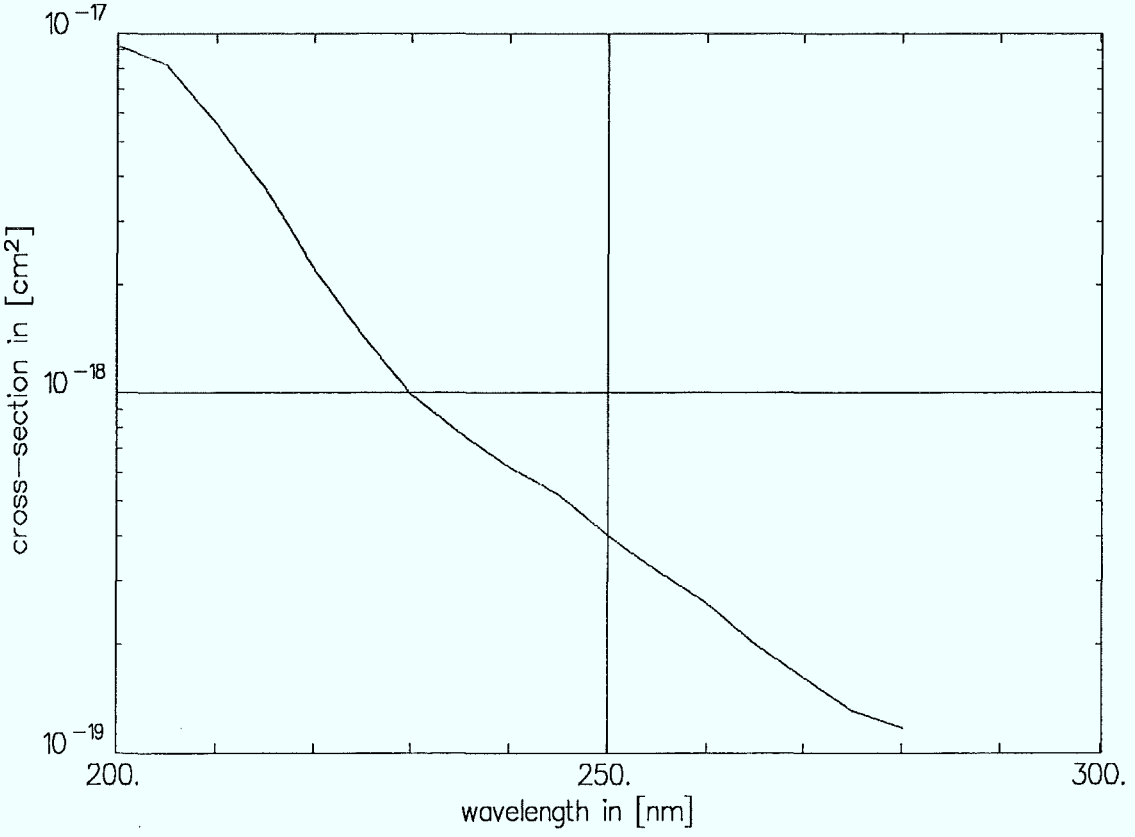
Substance: $N_2O_5$

Reference:
Yao, F., I. Wilson, and H. Johnston, Temperature-Dependent Ultraviolet Absorption Spectrum for Dinitrogen Pentoxide, J. Phys. Chem., **86** (1982), 3611-3615

Data: diagram

Temperature: 298. K

Temperature dependence: 298. / 300. / 277. / 263. / 243. / 225. K



Substance: $N_2O_5$

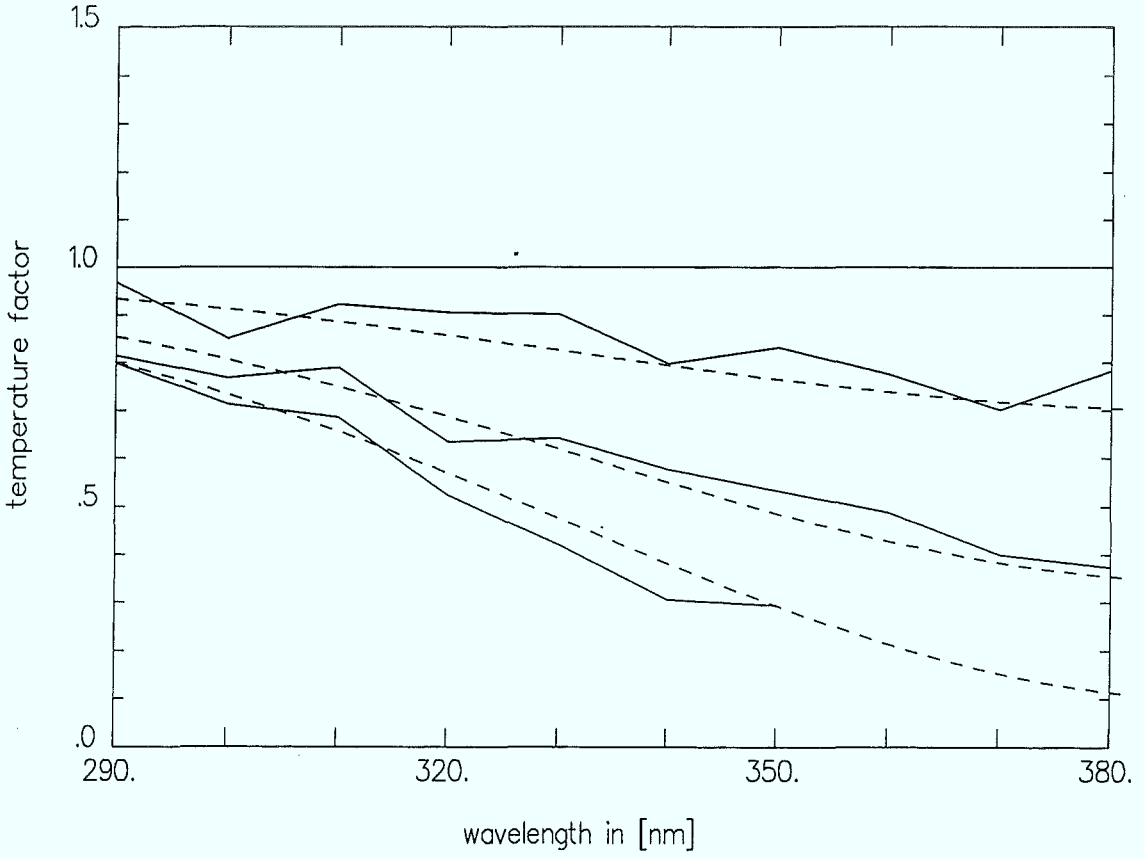
Reference:
Yao, F., I. Wilson, and H. Johnston, Temperature-Dependent Ultraviolet Absorption Spectrum for Dinitrogen Pentoxide, J. Phys. Chem., **86** (1982), 3611-3615

Temperatures: 277. / 263. / 243. / 225. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 2.295E-2 | b = | -1.084E-4 | c = | -1.5E-4 |
| d = | 0. | e = | 390. | f = | 0. |



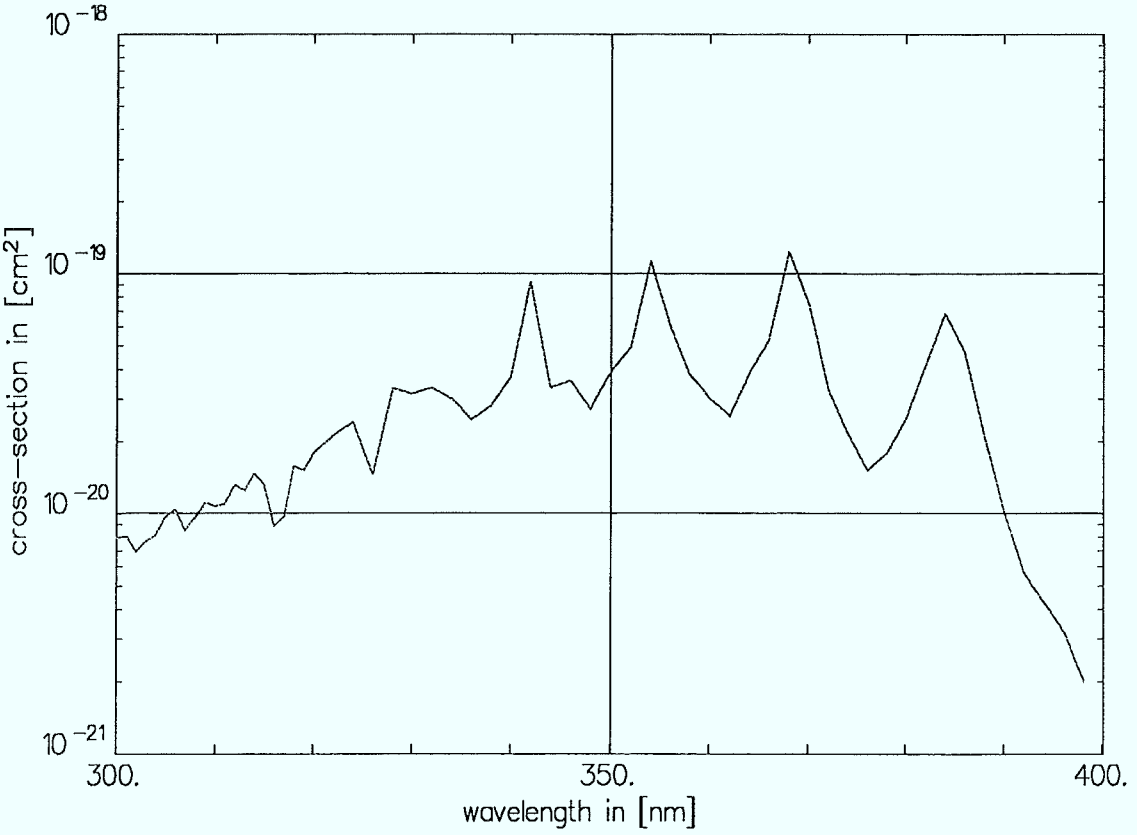
Substance: $HNO_2$

Reference:
Johnston, H.S., and R. Graham, Photochemistry of $NO_X$ and $HNO_X$ Compounds, Can. J. Chem., **52** (1975), 1415-1423

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no



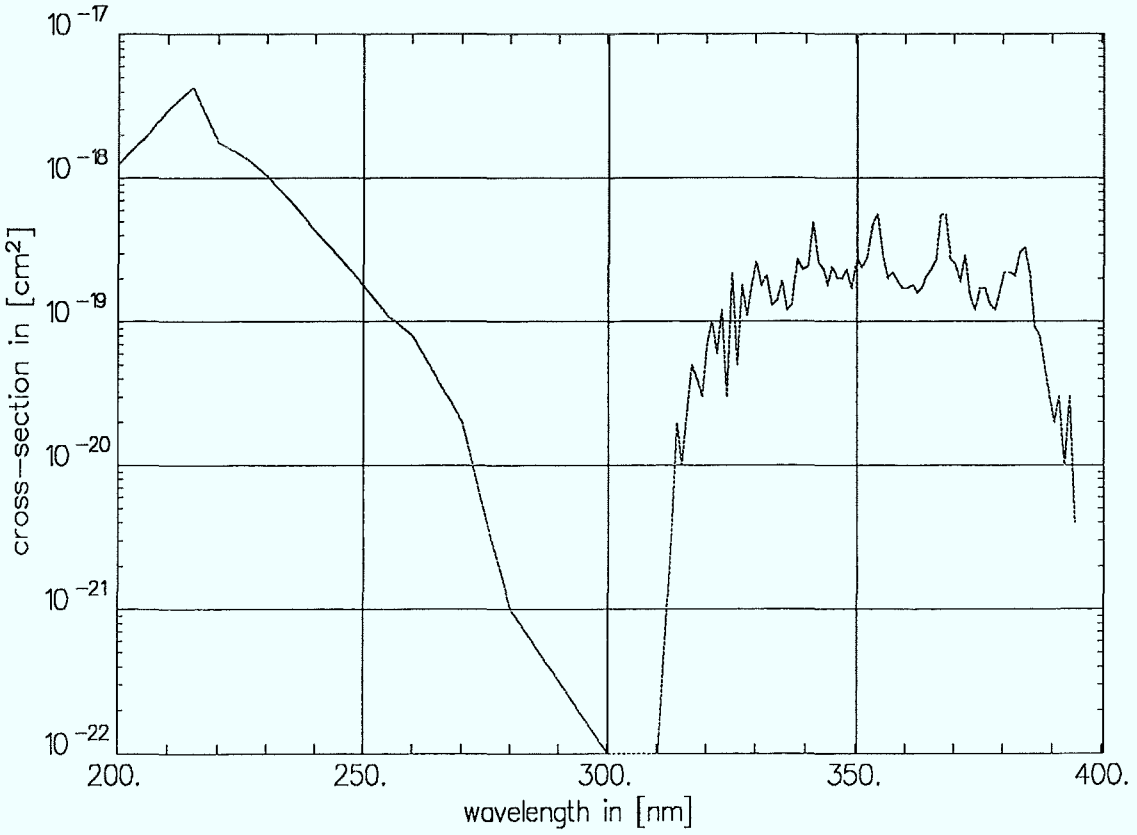
Substance: $HNO_2$

Reference:
Cox, R.A., and R.G. Derwent, The Ultra-Violet Absorption Spectrum of Gaseous Nitrous Acid, J. Photochem., **6** (1976/77), 23-34

Data: table Resolution: 1.0 / 5.0 nm

Temperature: 295. K

Temperature dependence: no



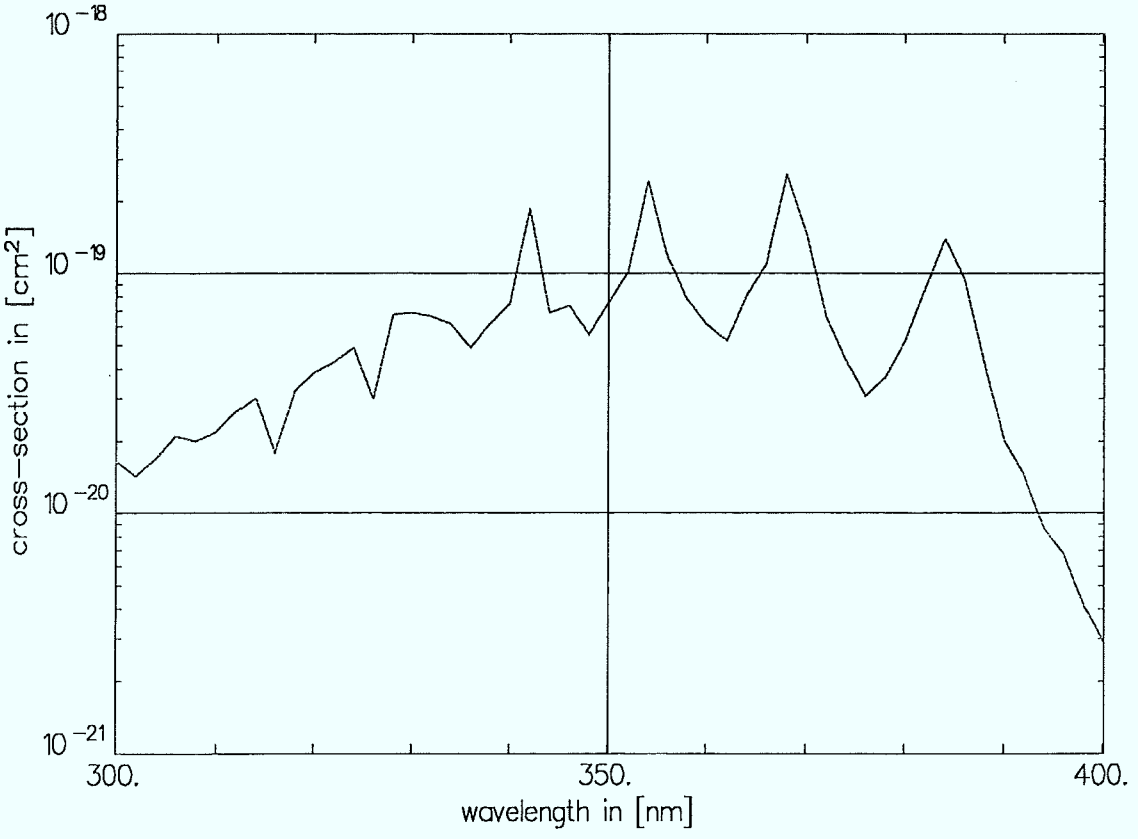
Substance: $HNO_2$

Reference:
NASA, Chlorofluoromethanes and the Stratosphere, NASA Reference Publication 1010 (1977), 35

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no



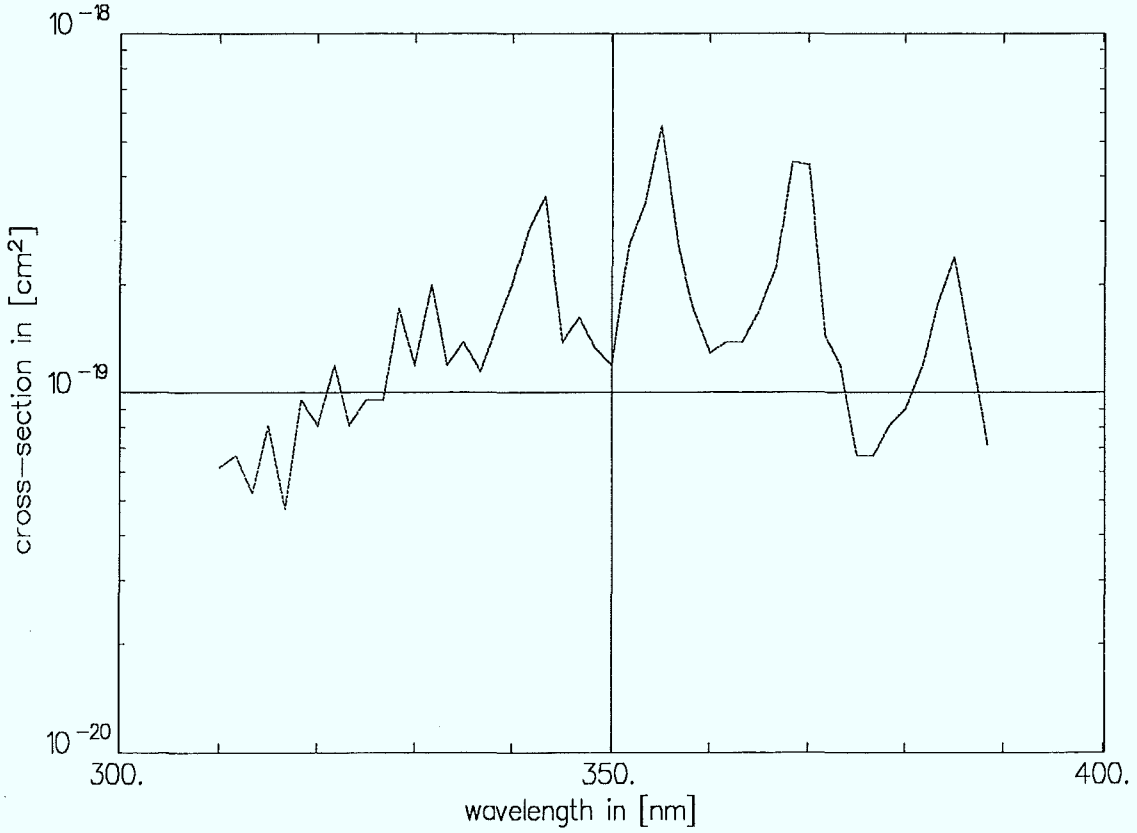
Substance: $HNO_2$

Reference:
D. Perner, priv. comm., KFA Jülich, 1977

Data: diagram Resolution: 1.6 - 17.0 nm

Temperature: 298. K

Temperature dependence: no



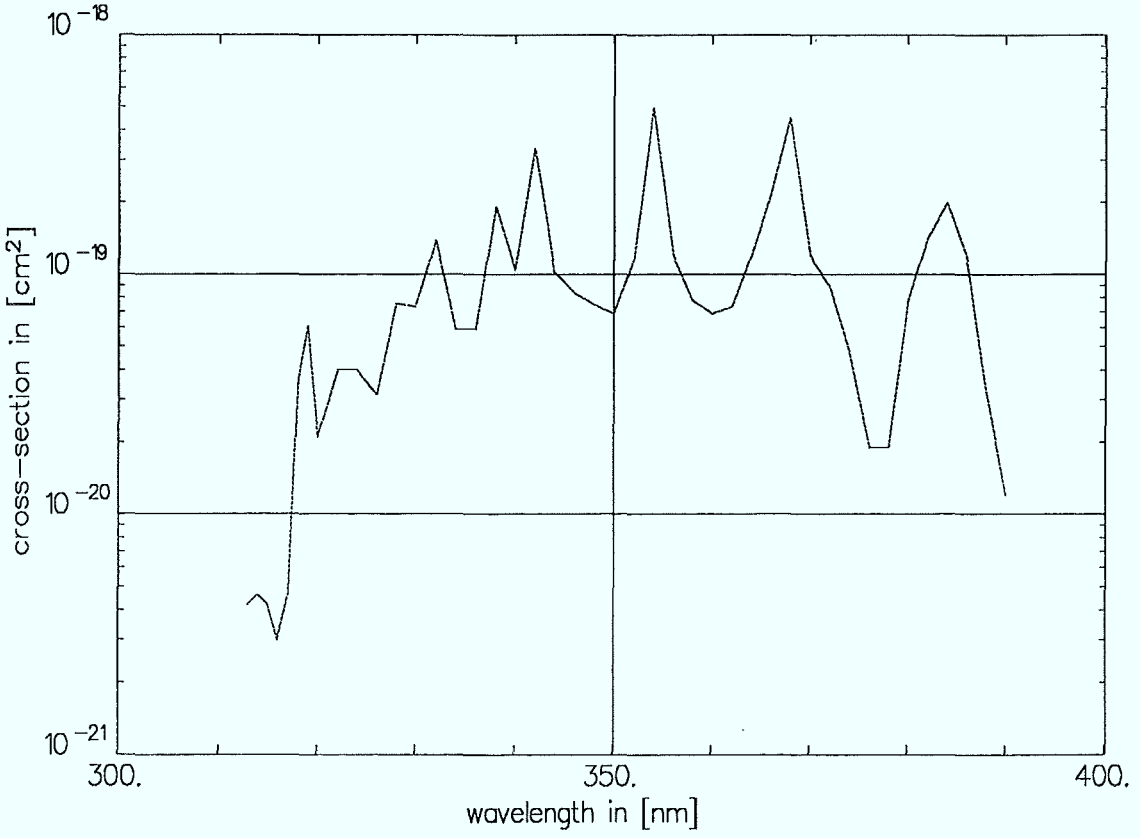
Substance: $HNO_2$

Reference:
Stockwell, W.R., and J.G. Calvert, The Near Ultraviolet Absorption Spectrum of Gaseous HONO and $N_2O_3$, J. Photochem., **8** (1978), 193-203

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no



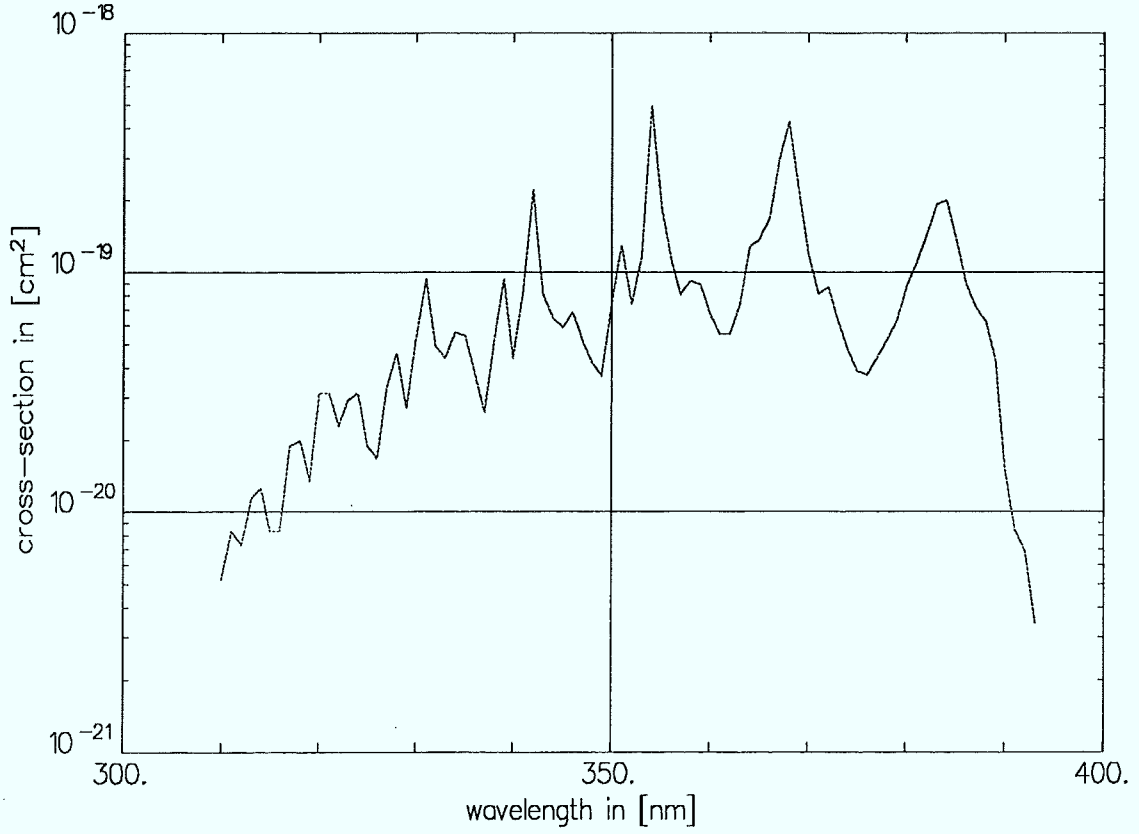
Substance: $HNO_2$

Reference:
Vasudev, R., Absorption Spectrum and Solar Photodissociation of Gaseous Nitrous Acid in the Actinic Wavelength Region, Geophys. Res. Lett., **17** (1990), 2153-2155

Data: table Resolution: 1.0 nm

Temperature: 300. K

Temperature dependence: no



Substance: $HNO_2$

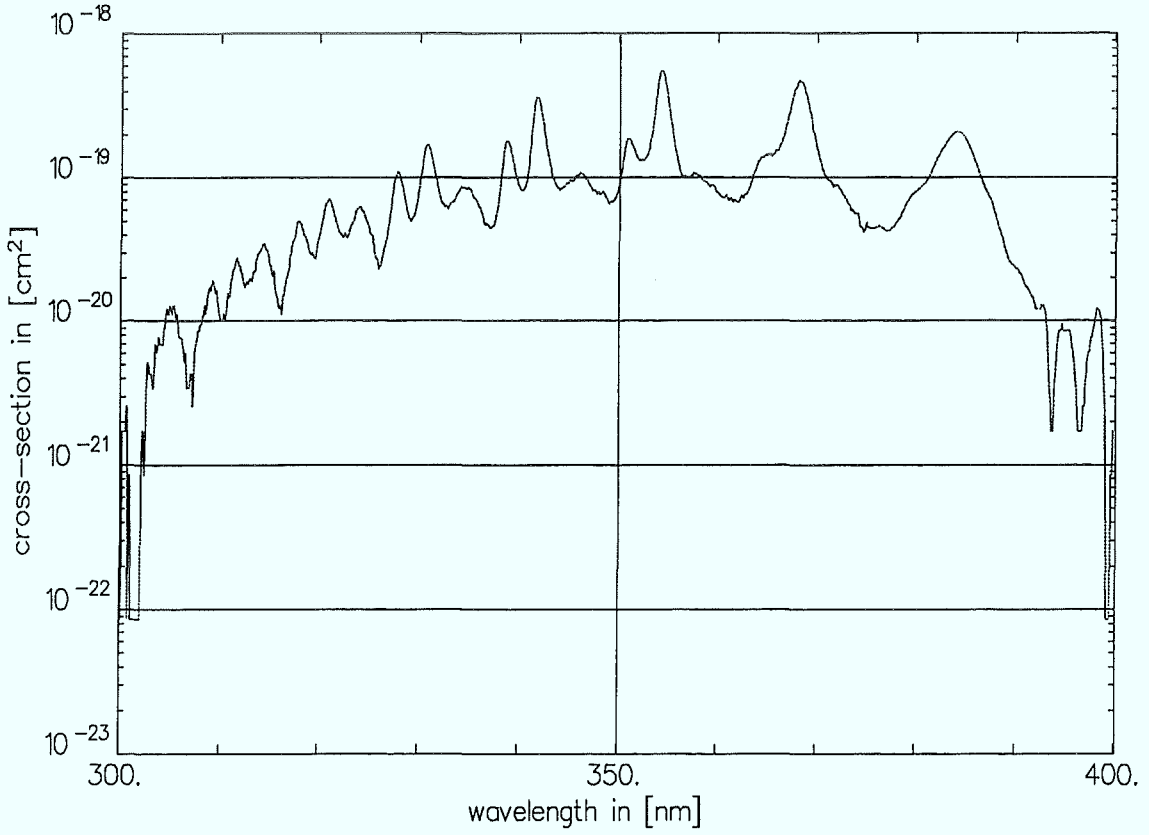
Reference:
Bongartz, A., J. Kames, F. Welter, and U. Schurath, Near-UV Absorption Cross Sections and Trans/Cis Equilibrium of Nitrous Acid, J. Phys. Chem., **95** (1991), 1076-1082

Data: disk Resolution: 0.1 nm

Temperature: 298. K

Temperature dependence: no

Comment: The cross-sections must be corrected by a factor of 0.855 (Bongartz et al., J. Atmos. Chem., **18** (1994), 149-169)



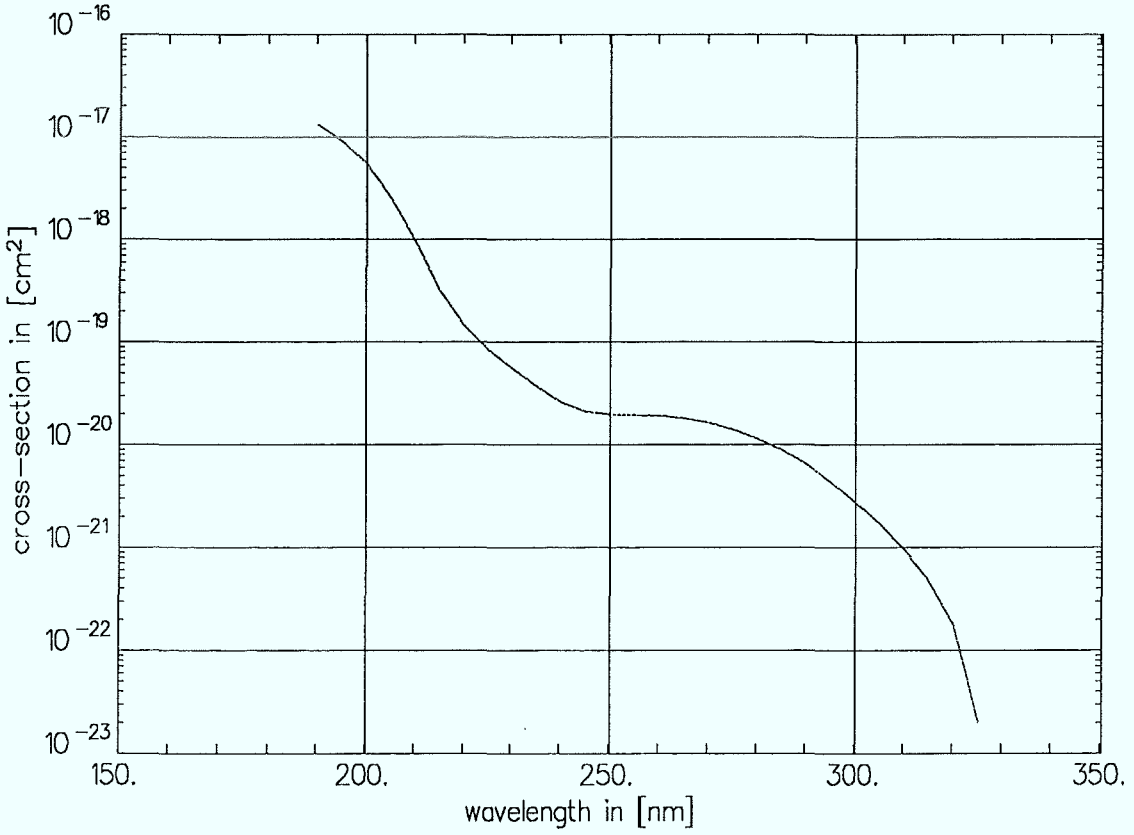
Substance: $HNO_3$

Reference:
Johnston, H.S., and R. Graham, Gas-Phase Ultraviolet Absorption Spectrum of Nitric Acid Vapor, J. Phys. Chem., 77 (1973), 62-63

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



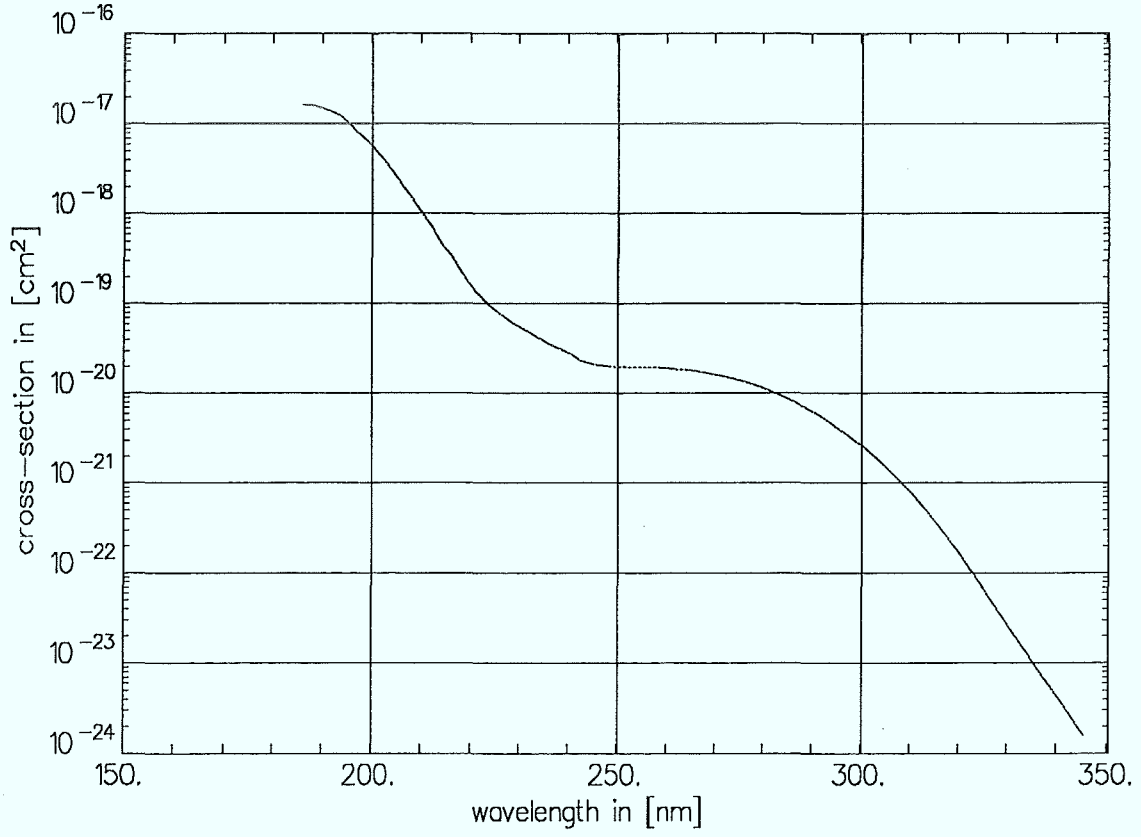
Substance: $HNO_3$

Reference:
Biaume, F., Nitric Acid Vapor Absorption Cross-Section Spectrum and Its Photodissociation in the Stratosphere, J. Photochem., 2 (1973/74), 139-149

Data: table Resolution: 1.8 - 5.0 nm

Temperature: 298. K

Temperature dependence: no



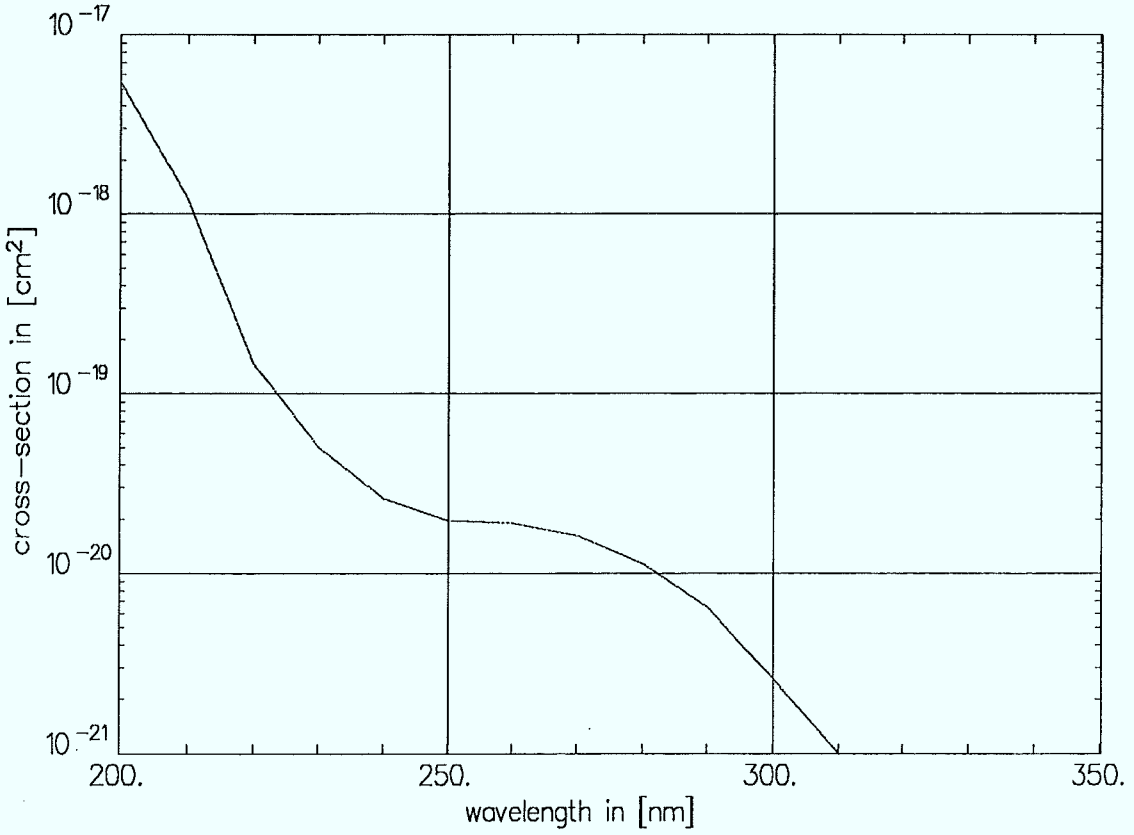
Substance: $HNO_3$

Reference:
Johnston, H.S., S.-G. Chang, and G. Whitten, Photolysis of Nitric Acid Vapor, J. Phys. Chem., **78** (1974), 1-7

Data: diagram

Temperature: 298. K

Temperature dependence: no



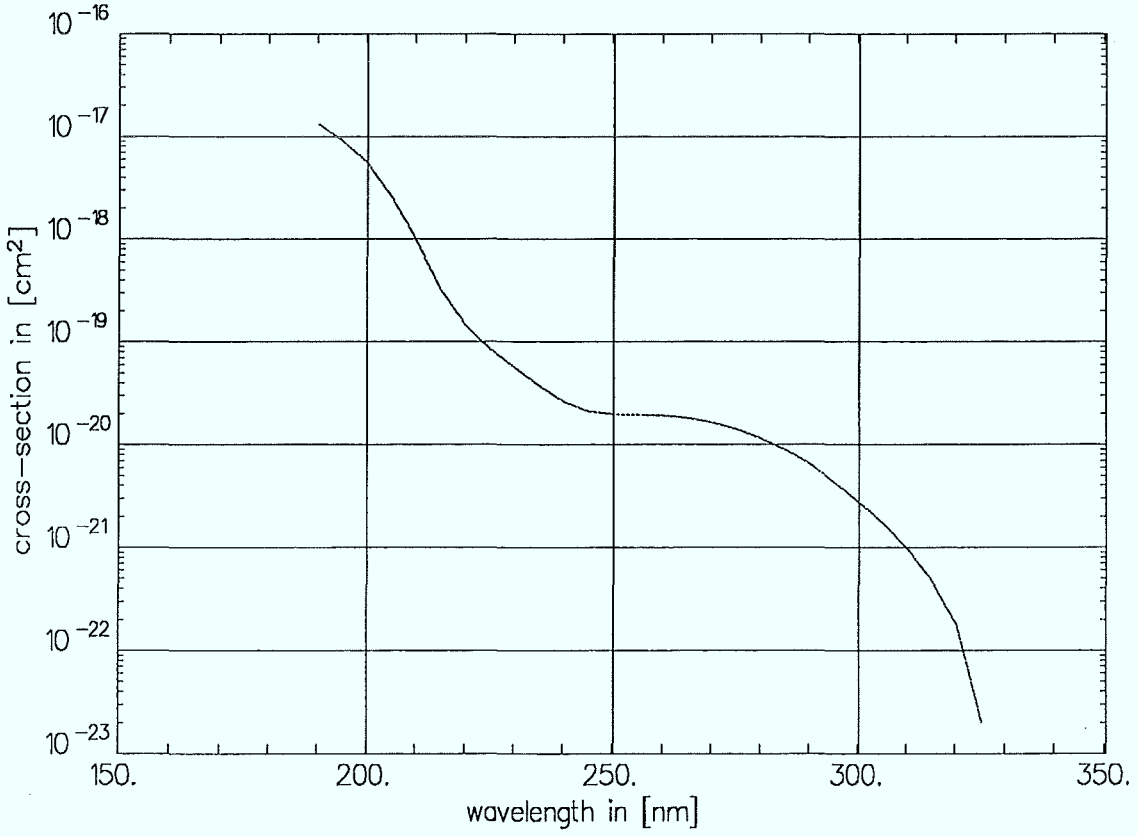
Substance: $HNO_3$

Reference:
Johnston, H.S., and R. Graham, Photochemistry of $NO_X$ and $HNO_X$ Compounds, Can. J. Chem., **52** (1975), 1415-1423

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



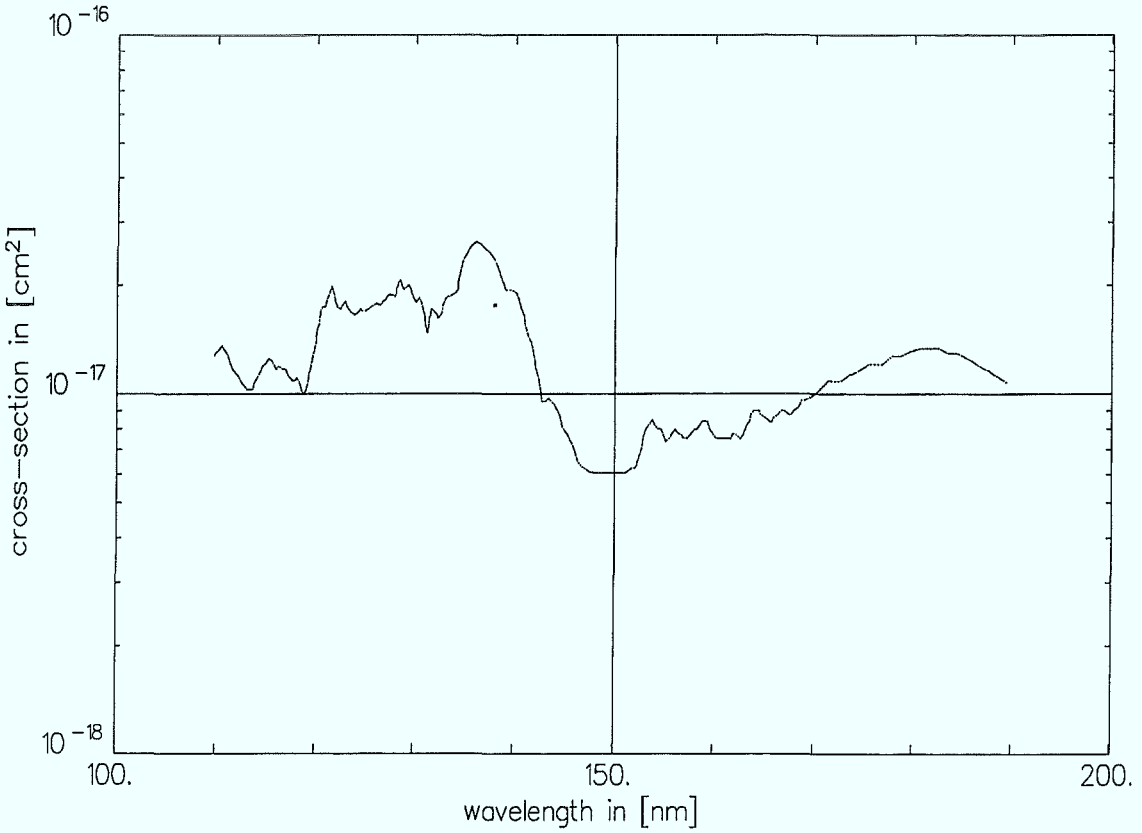
Substance: $HNO_3$

Reference:
Okabe, H., Photodissociation of Nitric Acid and Water in the Vacuum Ultraviolet; Vibrational and Rotational Distributions of $OH^2\Sigma^+$, J. Chem. Phys., 72 (1980), 6642-6650

Data: diagram

Temperature: 298. K

Temperature dependence: no



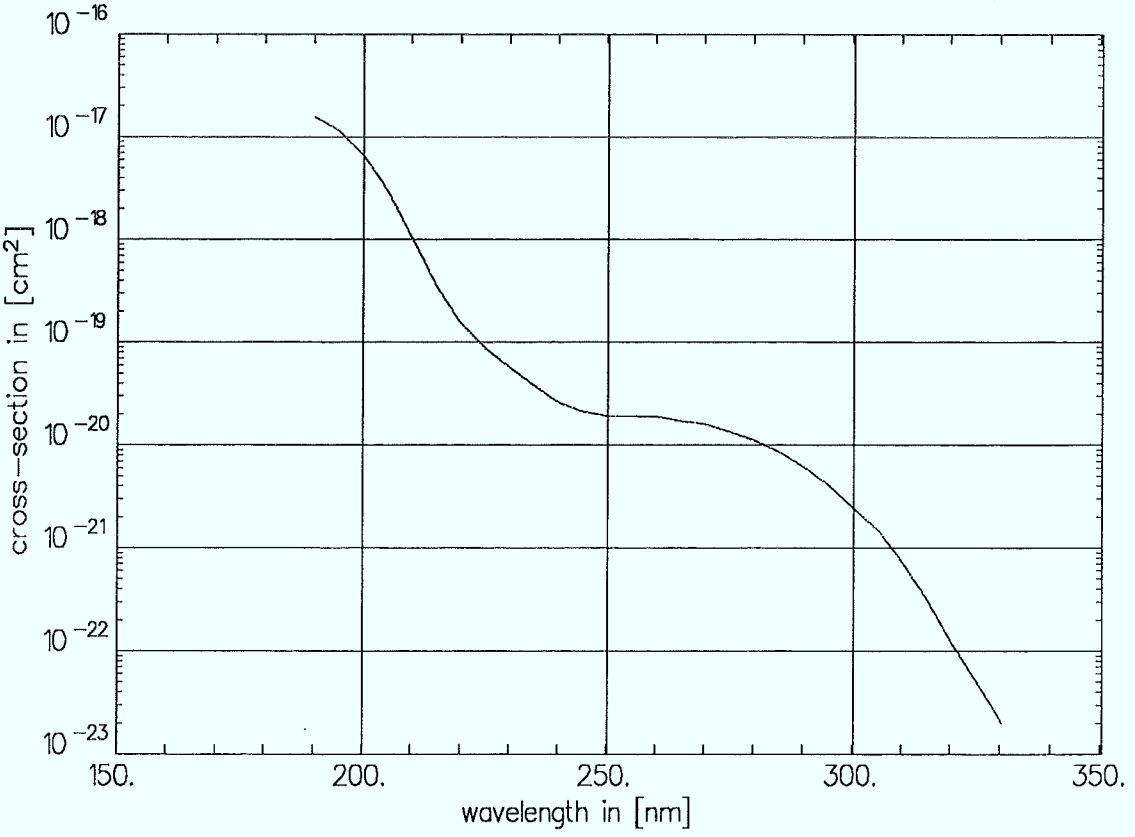
Substance: **$HNO_3$**

Reference:
Molina, L.T., and M.J. Molina, UV Absorption Cross Sections of $HO_2NO_2$ Vapor, J. Photochem., **15** (1981), 97-108

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



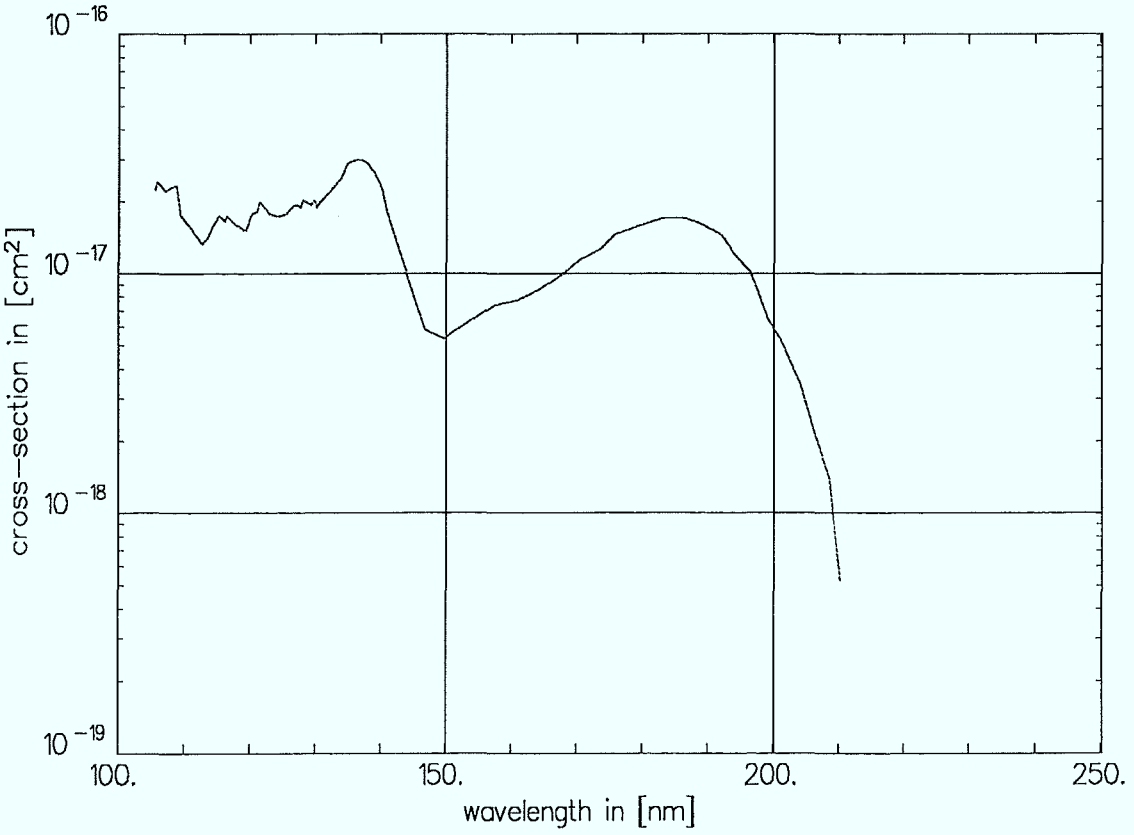
Substance: **$HNO_3$**

Reference:
Suto, M., and L.C. Lee, Photoabsorption and Photodissociation of $HONO_2$ in the 105-220 nm Region, J. Chem. Phys., **81** (1984), 1294-1297

Data: diagram

Temperature: 298. K

Temperature dependence: no



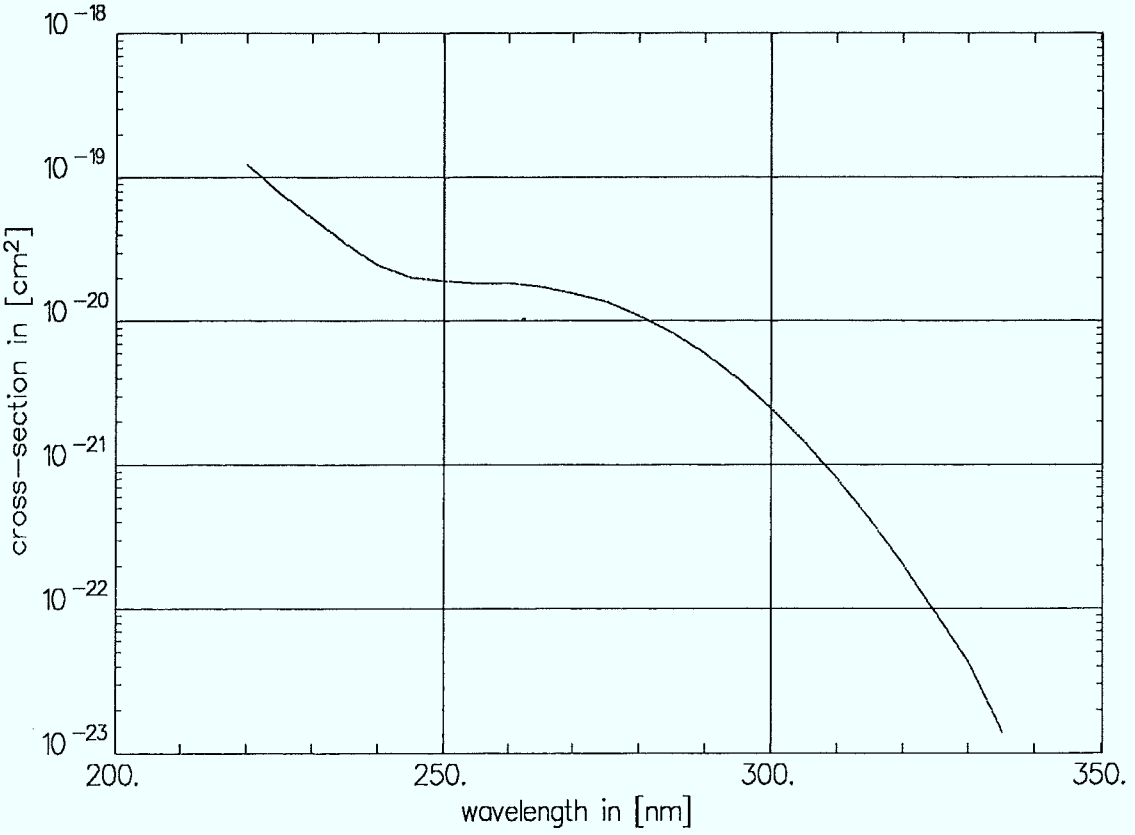
Substance: $HNO_3$

Reference:
Rattigan, O., E.R. Lutman, R.L. Jones, and R.A. Cox, Temperature Dependent Absorption Cross-Sections and Atmospheric Photolysis Rates of Nitric Acid, Ber. Bunsenges., **96** (1992), 399-404

Data: table Resolution: 5.0 nm

Temperature: 293. K

Temperature dependence: 293. / 239. K



Substance: $HNO_3$

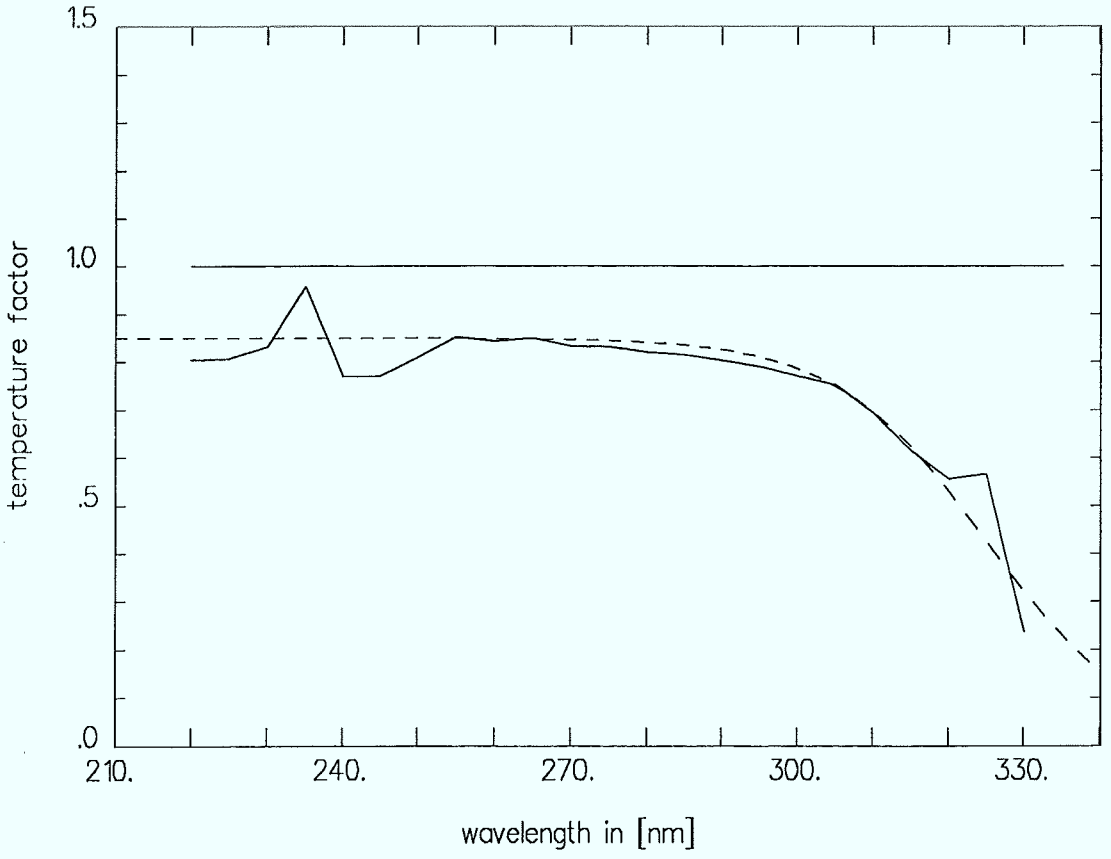
Reference:
Rattigan, O., E.R. Lutman, R.L. Jones, and R.A. Cox, Temperature Dependent Absorption Cross-sections and Atmospheric Photolysis Rates of Nitric Acid, Ber. Bunsenges., **96** (1992), 399-404

Temperatures: 293. / 239. K

Function: 5

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 2.0 | b = | -2.13E-3 | c = | 0. |
| d = | 1.852E-3 | e = | 325. | f = | 0. |



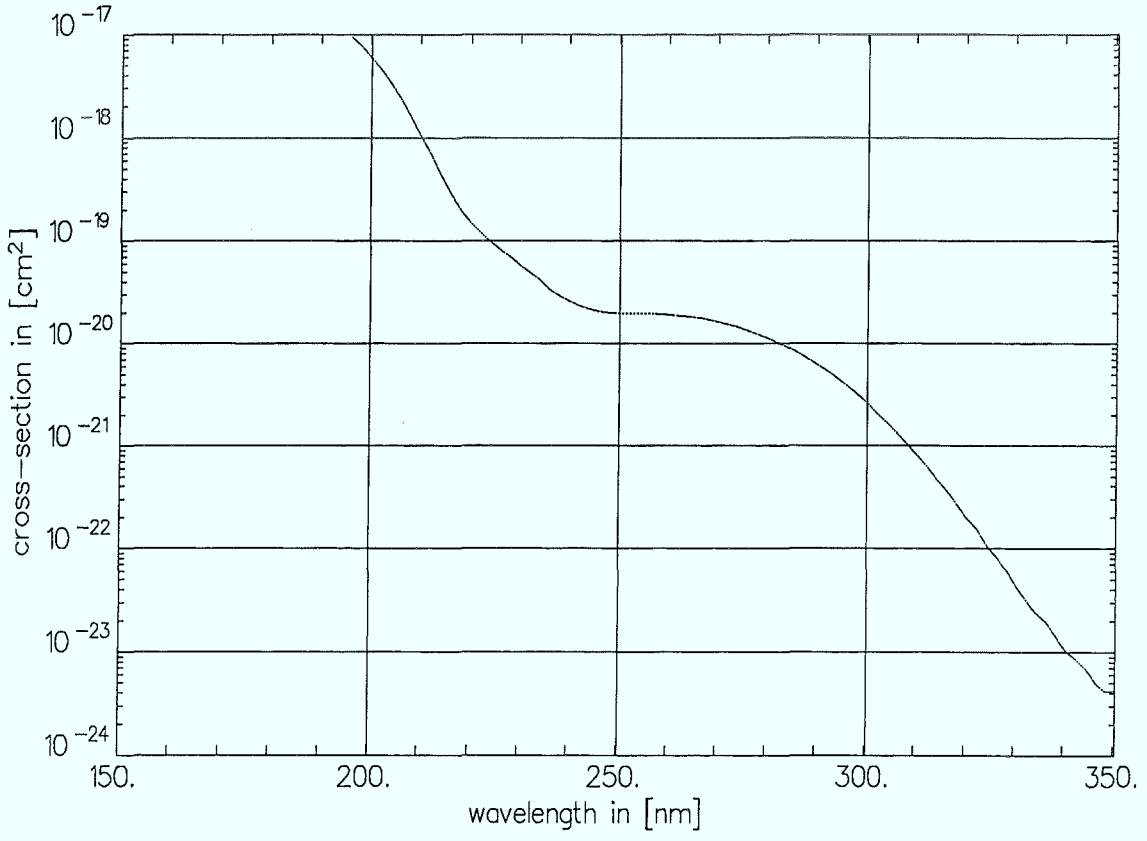
Substance: **$HNO_3$**

Reference:
Burkholder, J.B., R.K. Talukdar, A.R. Ravishankara, and S. Solomon, Temperature Dependence of the $HNO_3$ UV Absorption Cross Sections, J. Geophys. Res., **98** (1993), 22937-22948

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: 298. / 280. / 260. / 240. K



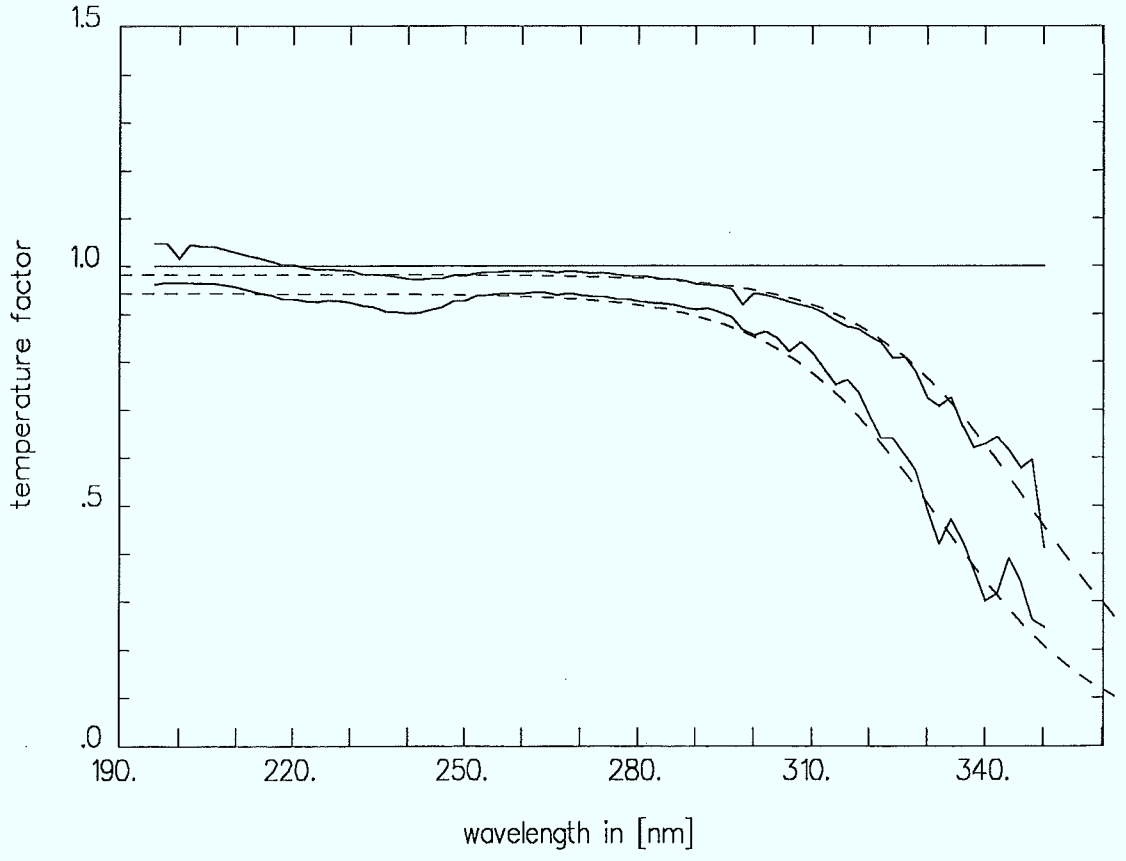
Substance: $HNO_3$

Reference:
Burkholder, J.B., R.K. Talukdar, A.R. Ravishankara, and S. Solomon, Temperature Dependence of the $HNO_3$ UV Absorption Cross Sections, J. Geophys. Res., **98** (1993), 22937-22948

Temperatures: 298. /280. / 240. K

Function: 5

| Fit Parameter: | a = | 1.0 | b = | -1.E-3 | c = | 7.E-2 |
|---|---|---|---|---|---|---|
| | d = | 0. | e = | 236. | f = | 0.4 |



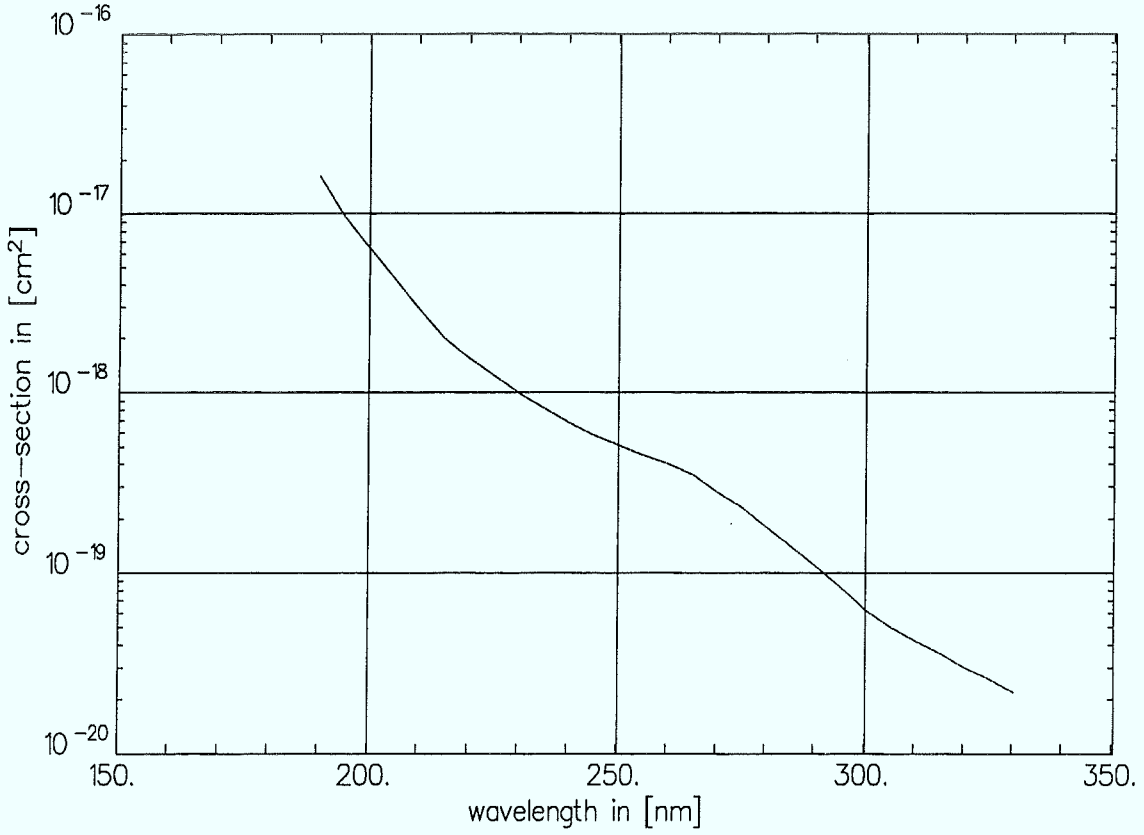
Substance: $HNO_4$

Reference:
Graham, R.A., A.M. Winter, and J.N. Pitts, Jr., Ultraviolet and Infrared Absorption Cross Sections of Gas Phase $HO_2NO_2$, Geophys. Res. Lett., 5 (1978), 909-911

Data: table Resolution: 5.0 nm

Temperature: 269. K

Temperature dependence: no



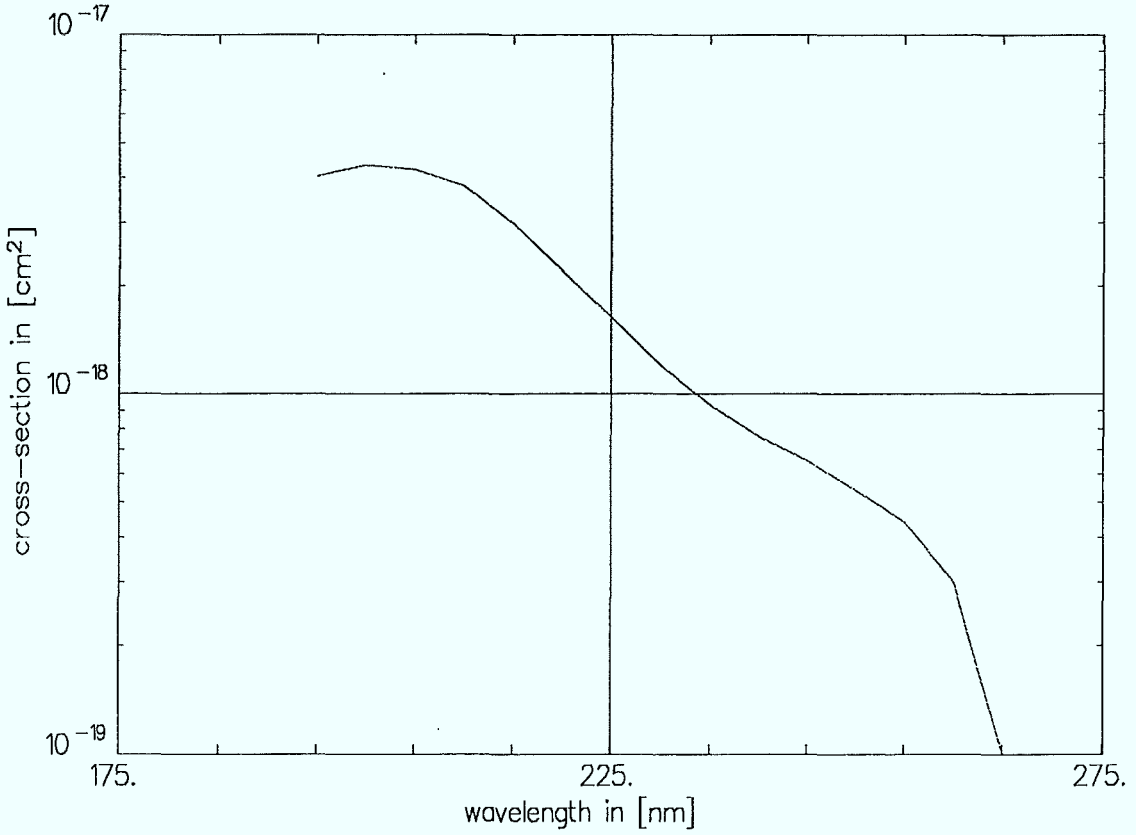
Substance: $HNO_4$

Reference:
Cox, R.A., and K. Patrick, Kinetics of the Reaction $HO_2+NO_2(+M)=HO_2NO_2$ Using Molecular Modulation Spectrometry, Int. J. Chem. Kin., **11** (1979), 635-648

Data: table Resolution: 5.0 nm

Temperature: 283.5 K

Temperature dependence: no



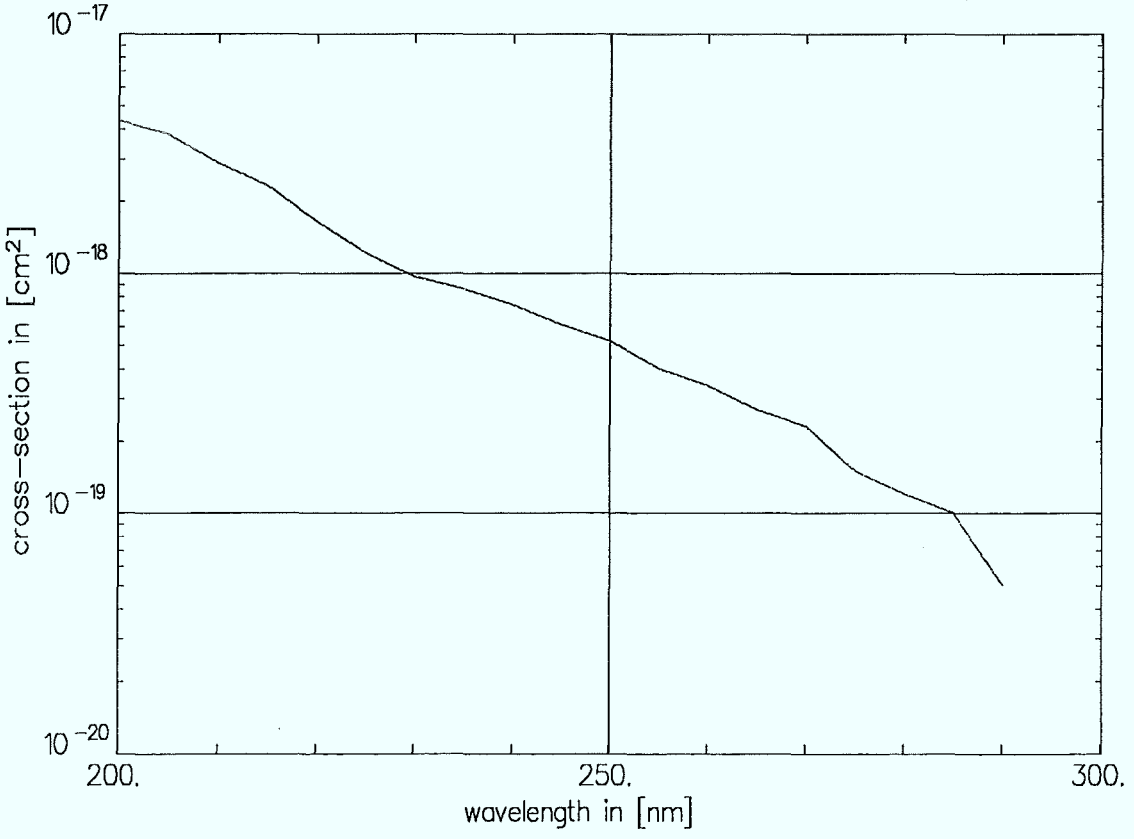
Substance: **$HNO_4$**

Reference:
Morel, O., R. Simonaitis, and J. Heicklen, Ultraviolet Absorption Spectra of $HO_2NO_2$, $CCl_3O_2NO_2$, $CCl_2FO_2NO_2$, and $CH_3O_2NO_2$, Chem. Phys. Lett., **73** (1980), 38-42

Data: table Resolution: 5.0 nm

Temperature: 296. K

Temperature dependence: no



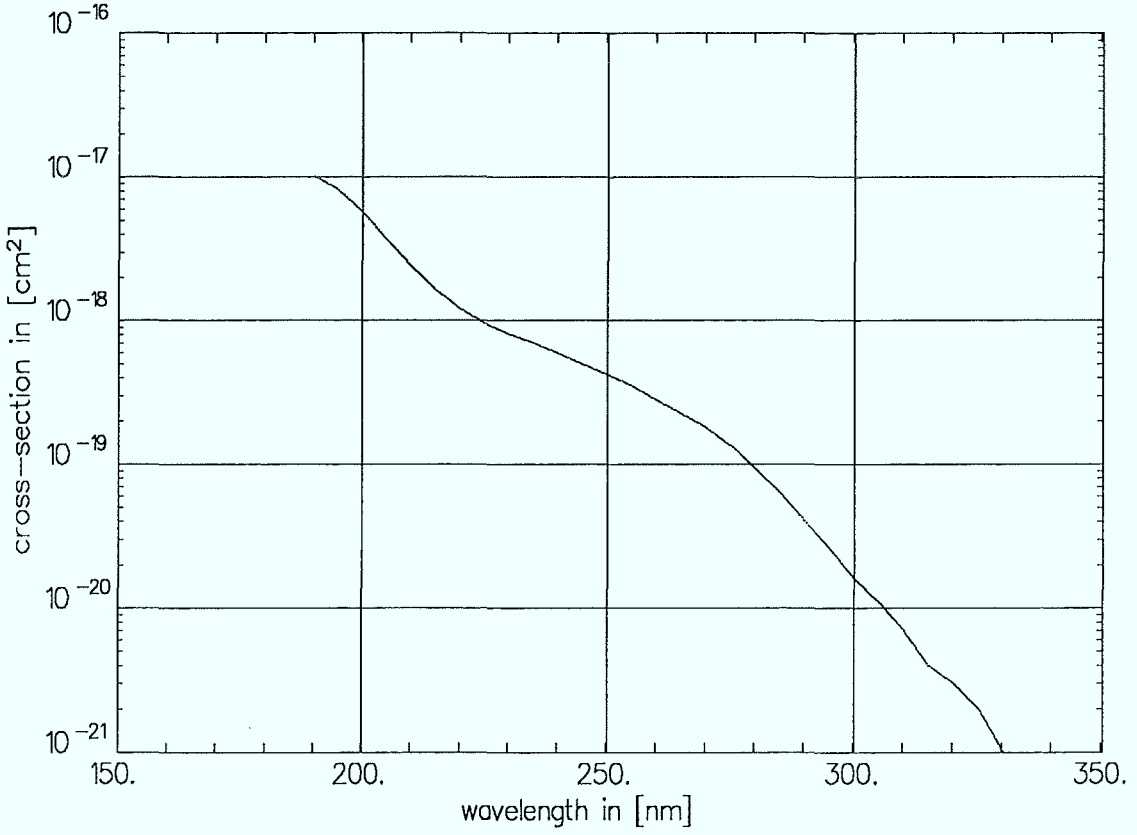
Substance: **$HNO_4$**

Reference:
Molina, L.T., and M.J. Molina, UV Absorption Cross Sections of $HO_2NO_2$ Vapor, J. Photochem., **15** (1981), 97-108

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **$HNO_4$**

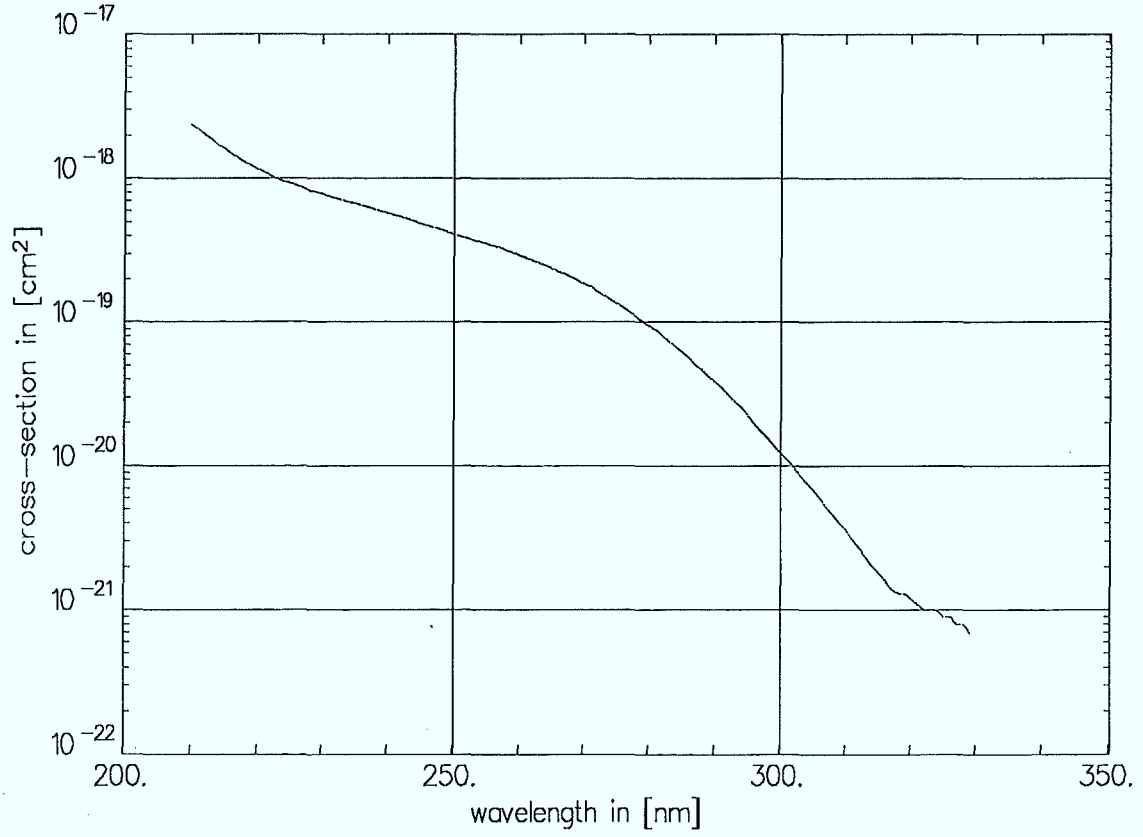
Reference:
Singer, R.J., J.N. Crowley, J.P. Burrows, W. Schneider, and G.K. Moortgat, Measurement of the Absorption Cross-Section of Peroxynitric Acid between 210 and 330 nm in the Range 253 - 298 K, J. Photochem. Photobiol., **48** (1989), 17-32

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: No significant change in the absorption cross-section of $HNO_4$ was observed between 253 and 298 K.



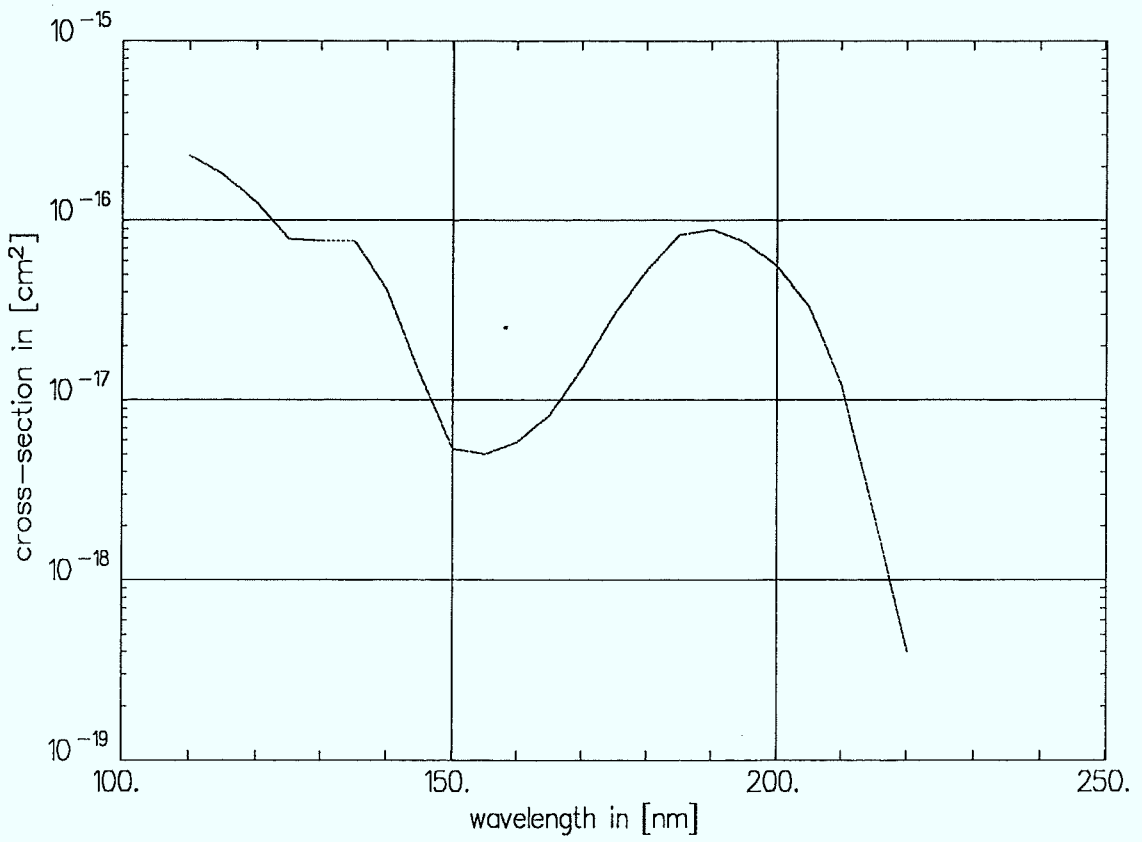
Substance: $NH_3$

Reference:
Watanabe, K., Photoionization and Total Absorption Cross Section of Gases. I. Ionization Potentials of Several Molecules. Cross Sections of $NH_3$ and NO, J. Chem. Phys. **22** (1954), 1564-1570

Data: diagram

Temperature: 298. K

Temperature dependence: no



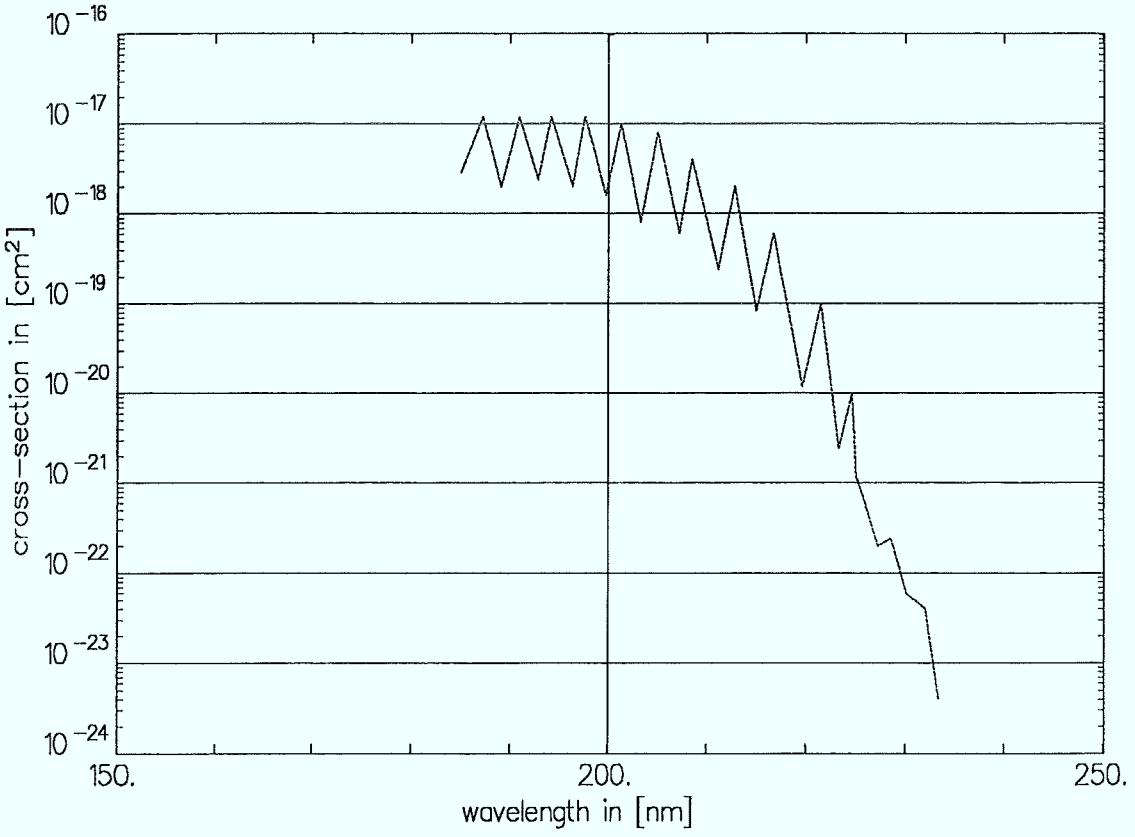
Substance: $NH_3$

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



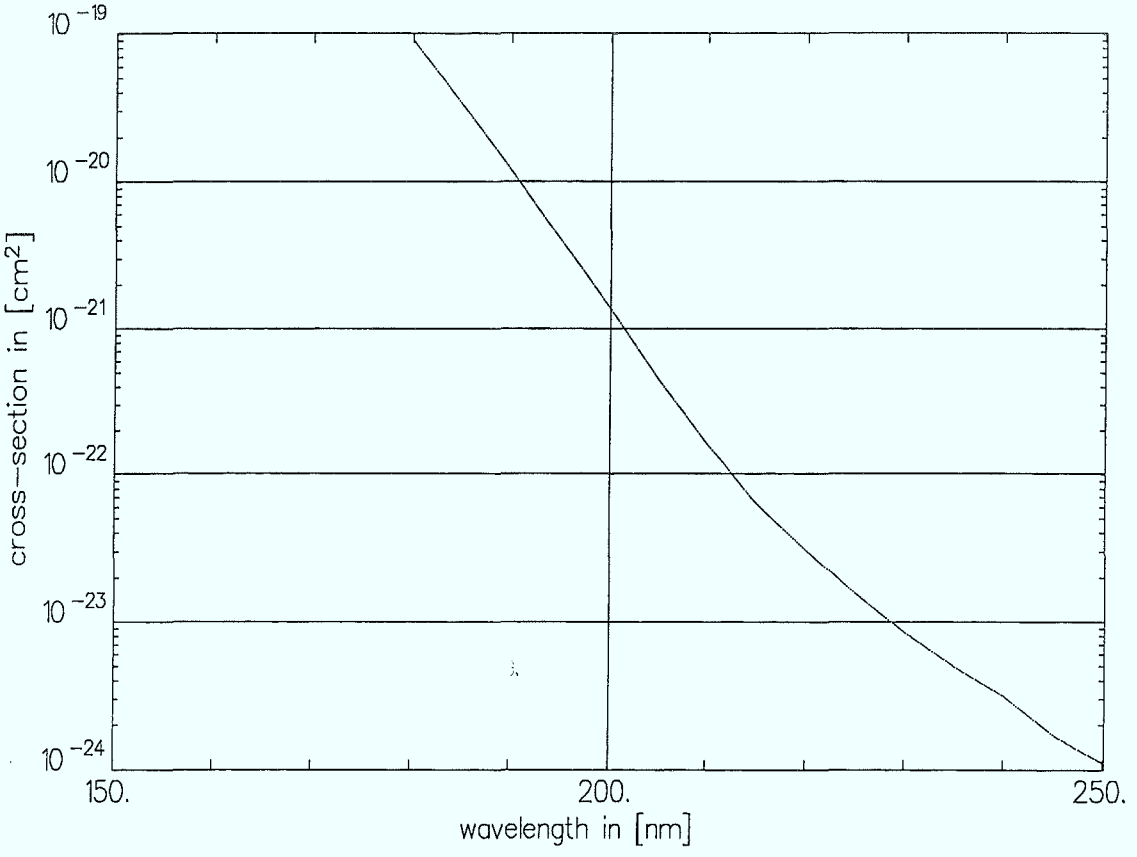
Substance: $NF_3$

Reference:
Molina, L.T., P.J. Wooldridge, and M.J. Molina, Atmospheric Reactions and Ultraviolet and Infrared Absorptivities of Nitrogen Trifluoride, Geophys. Res. Lett., **22** (1995), 1873-1876.

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



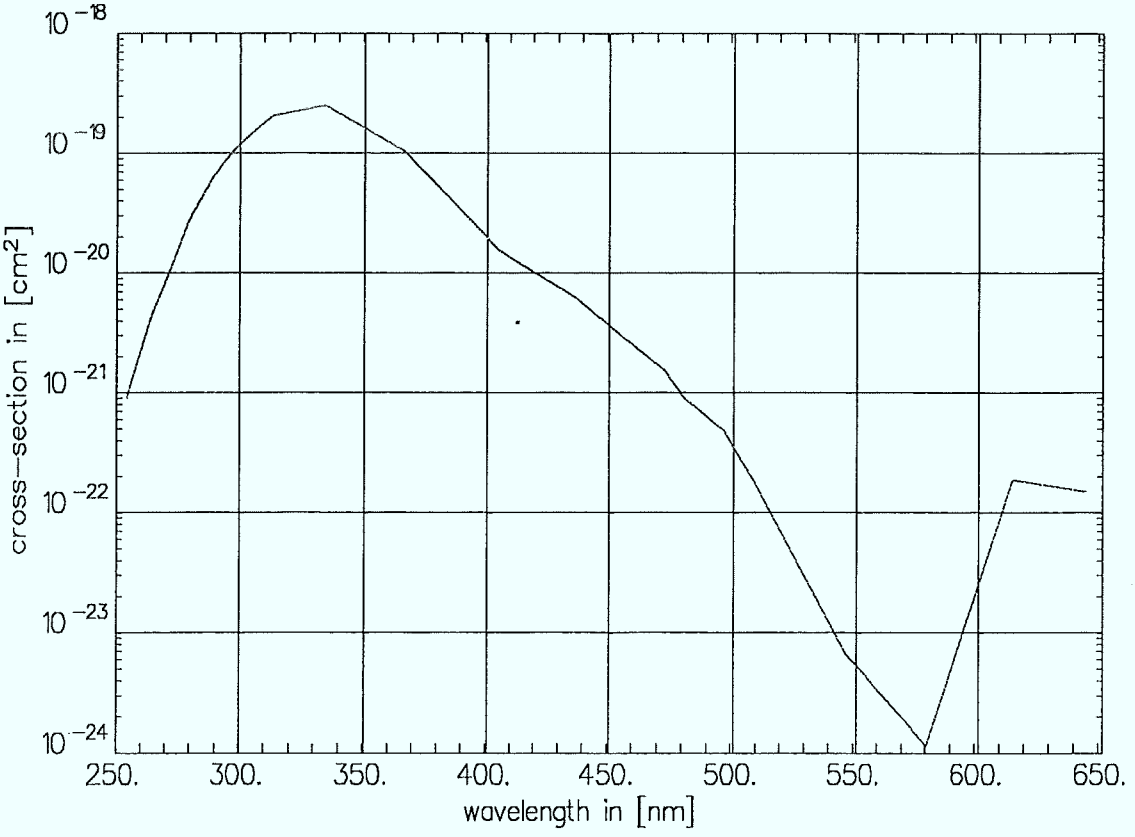
Substance: $Cl_2$

Reference:
von Halban, H., and K. Siedentopf, Die Lichtabsorption des Chlors, Z. Elektrochem., **28** (1922), 496-499

Data: table Resolution: 10.0 nm

Temperature: 293. K

Temperature dependence: no



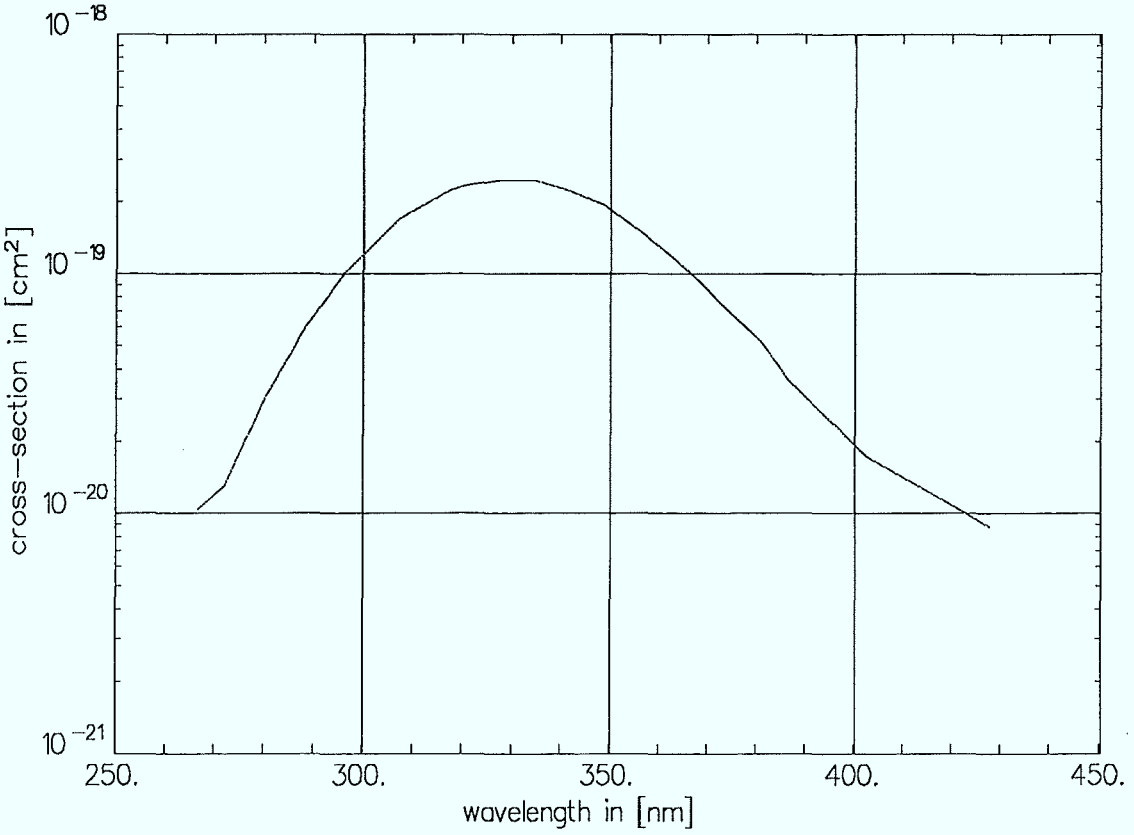
Substance: $Cl_2$

Reference:
Gibson, G.E., and N.S. Bayliss, Variation with Temperature of the Continuous Absorption Spectrum of Diatomic Molecules: Part I. Experimental, The Absorption Spectrum of Chlorine, Phys. Rev., **44** (1933), 188-192

Data: table Resolution: 5.6 - 25.2 nm

Temperature: 291. K

Temperature dependence: no



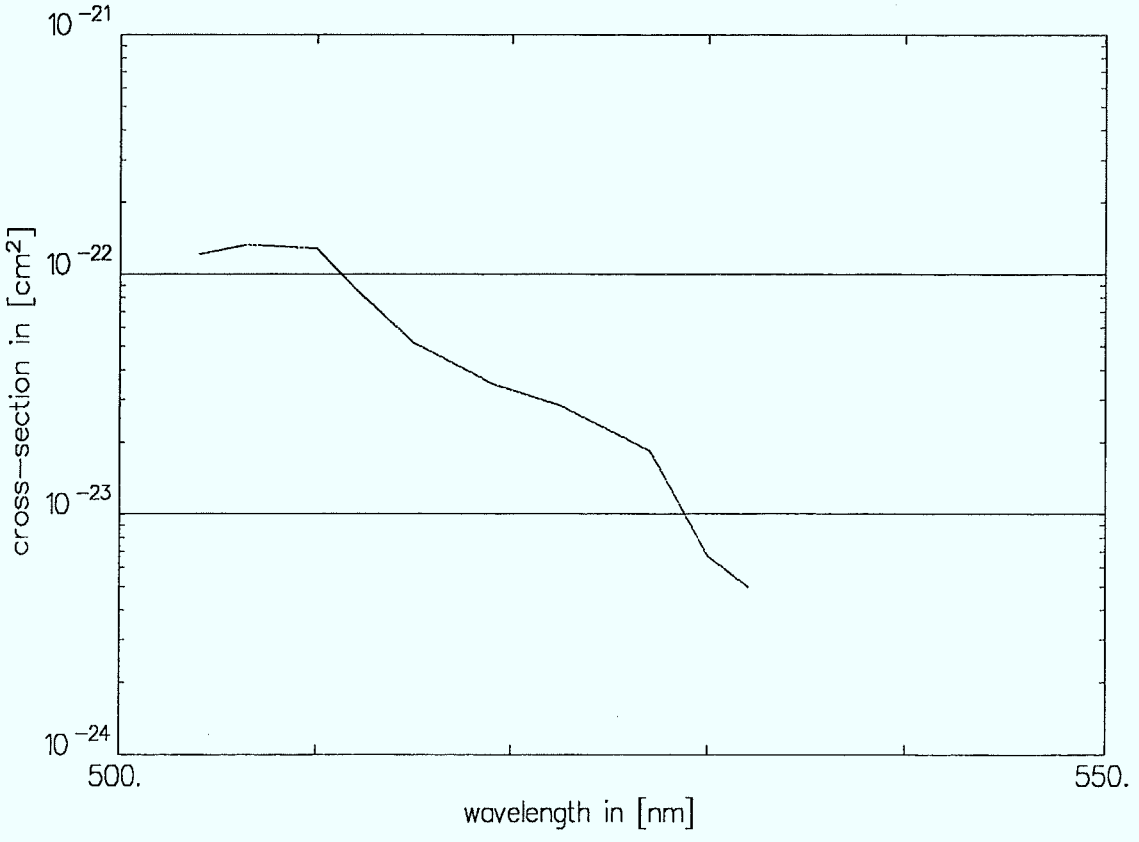
Substance: $Cl_2$

Reference:
Jones, F.W., and W. Spooner, Absorption of Light by Gaseous Chlorine in the Wavelength Region 5040 A.U. to 5320 A.U., Trans. Faraday Soc., **31** (1935), 811-813

Data: table Resolution: 10.0 nm

Temperature: 291. K

Temperature dependence: no



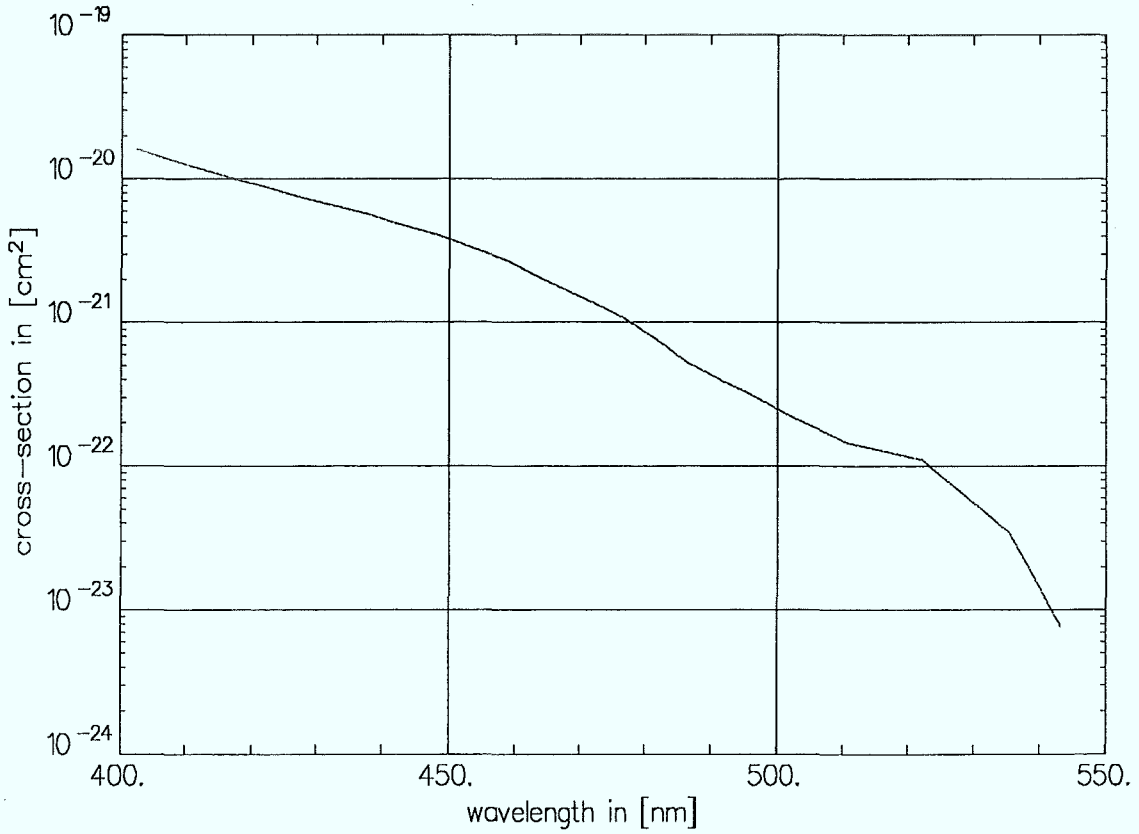
Substance: $Cl_2$

Reference:
Aickin, R.G., and N.S. Bayliss, The Continuous Absorption Spectrum of Chlorine in the Region 4000-5000 A, Trans. Faraday Soc., **33** (1937), 1333-1338

Data: table Resolution: 10.0 nm

Temperature: 291. K

Temperature dependence: no



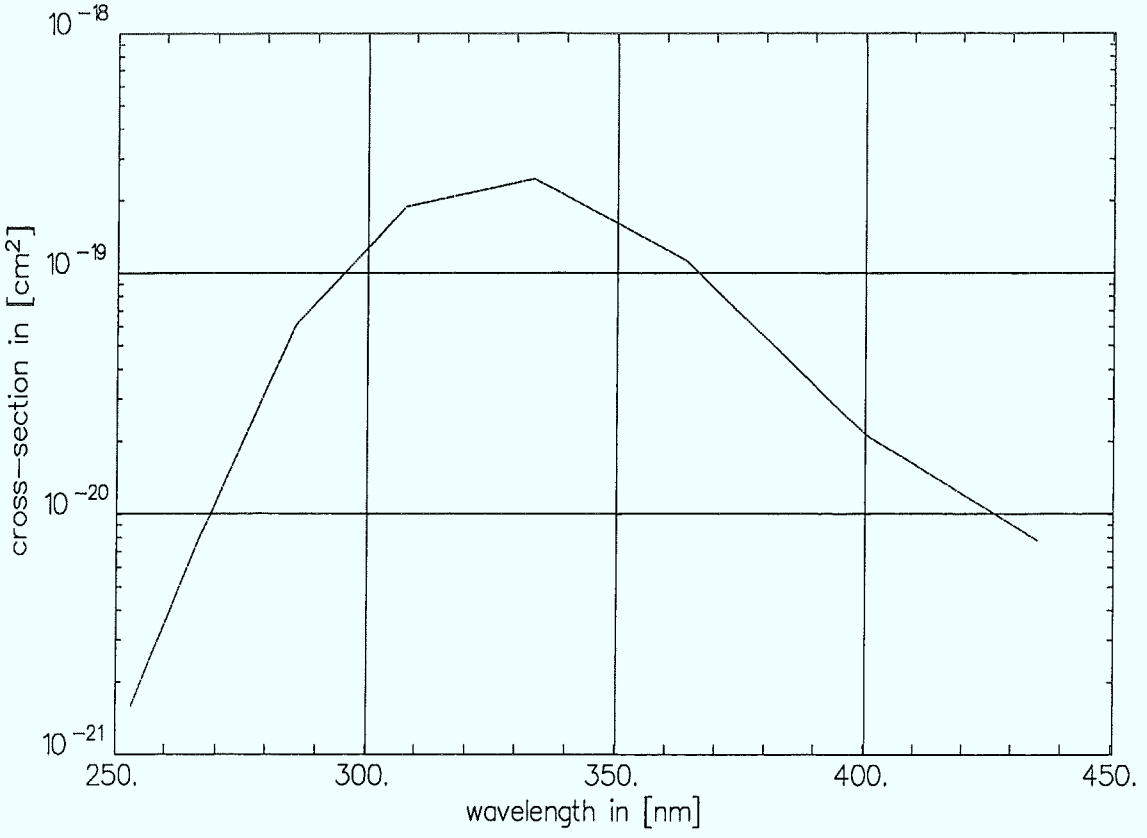
Substance: $Cl_2$

Reference:
Martin, H., and R. Gareis, Die Kinetik der Reaktion von $ClO_2$ mit $NO_2$ in der Lösungsphase, Z. Elektrochem., **60** (1956), 959-964

Data: diagram

Temperature: 298. K

Temperature dependence: no



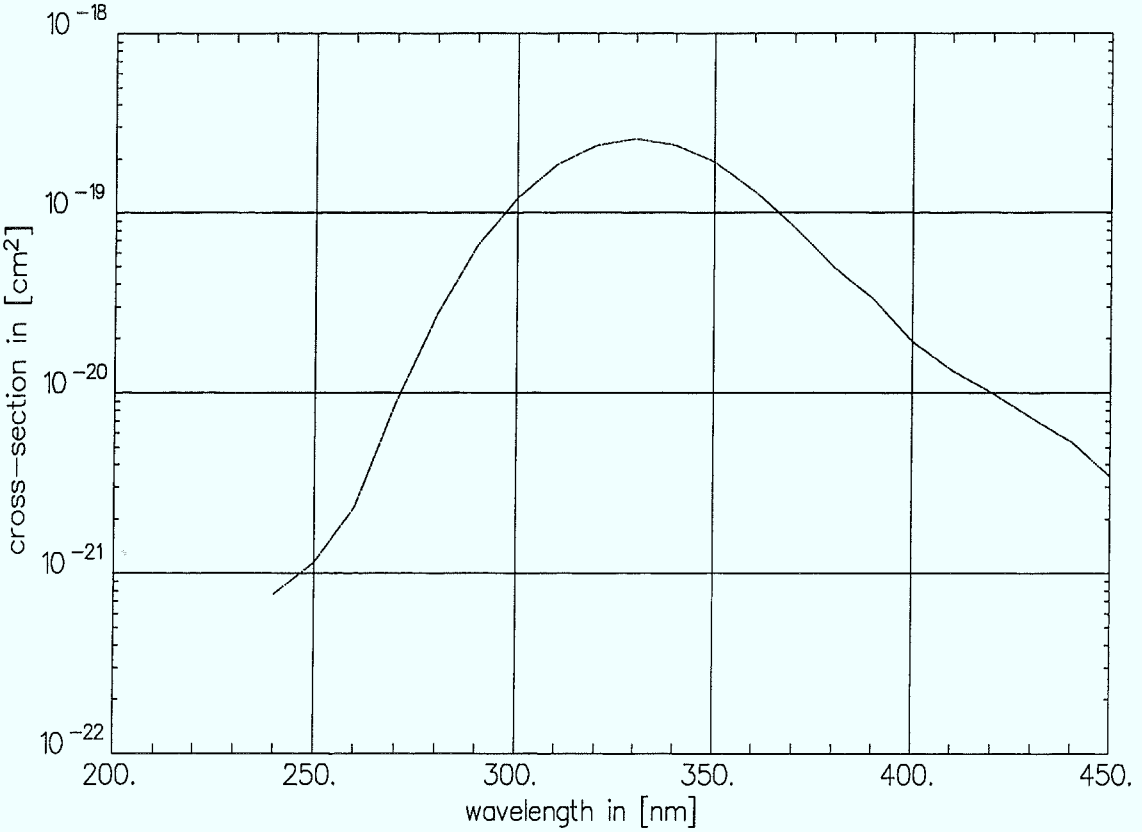
Substance: $Cl_2$

Reference:
Seery, D.J., and D. Britton, The Continuous Absorption Spectra of Chlorine, Bromine, Bromine Chloride, Iodine Chloride, and Iodine Bromide, J. Phys. Chem., **68** (1964), 2263-2266

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



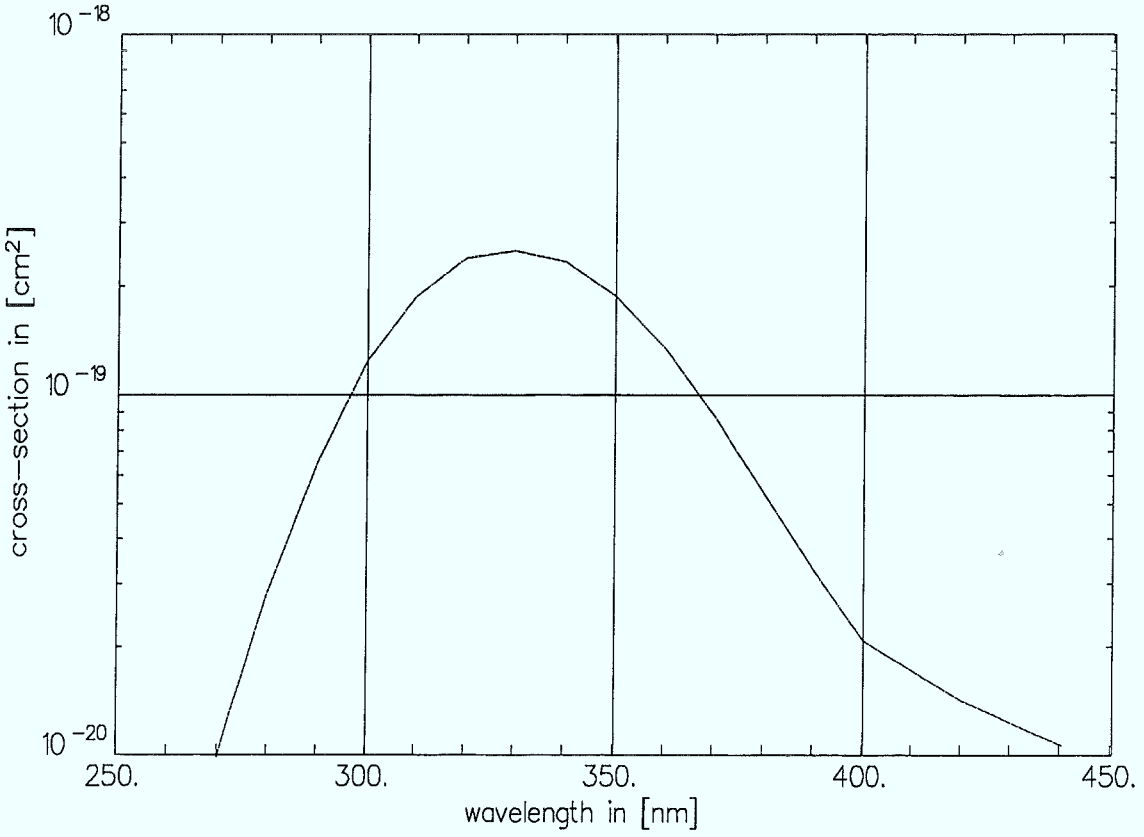
Substance: $Cl_2$

Reference:
Knauth, H.-D., H. Alberti, and H. Clausen, Equilibrium Constant of the Gas Reaction $Cl_2O + H_2O = 2HOCl$ and the Ultraviolet Spectrum of HOCl, J. Phys. Chem., **83** (1979), 1604-1612

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 333. K

Temperature dependence: no



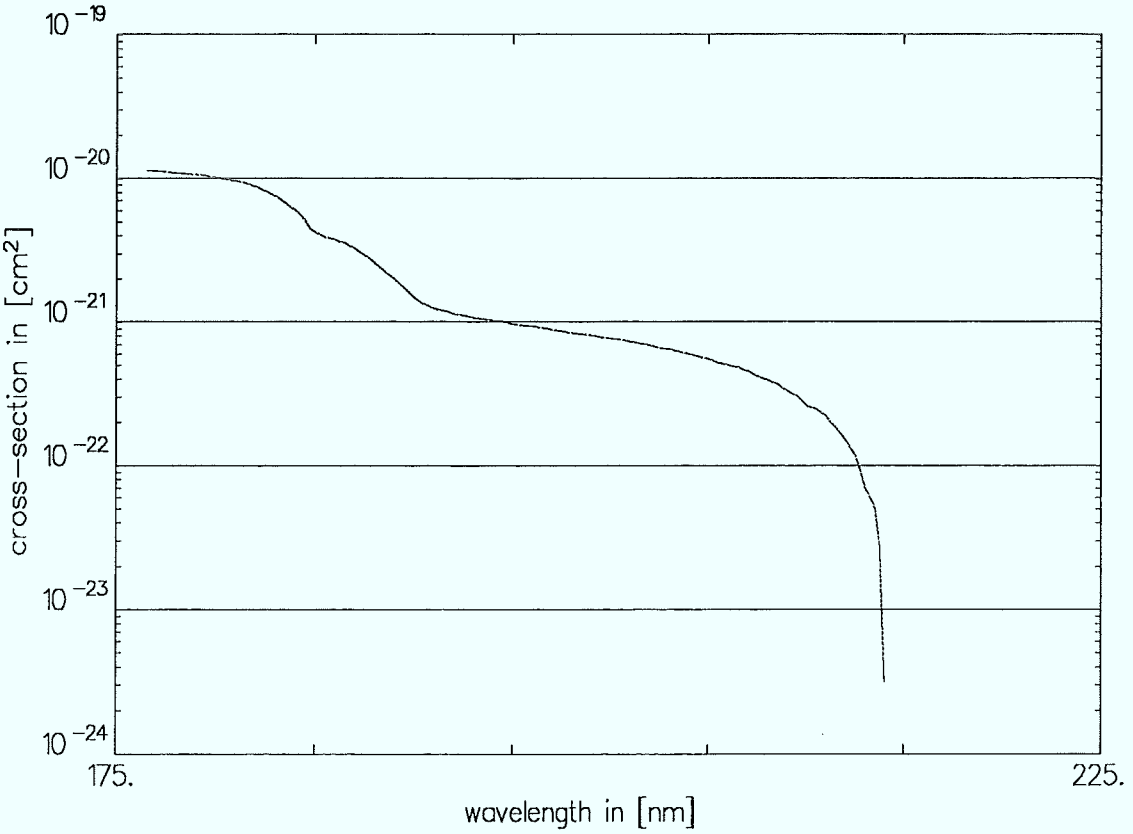
Substance: $Cl_2$

Reference:
Roxlo, C., and A. Mandl, Vacuum Ultraviolet Absorption Cross Sections for Halogen Containing Molecules, J. Appl. Phys., **51** (1980), 2969-2972

Data: diagram

Temperature: 298. K

Temperature dependence: no



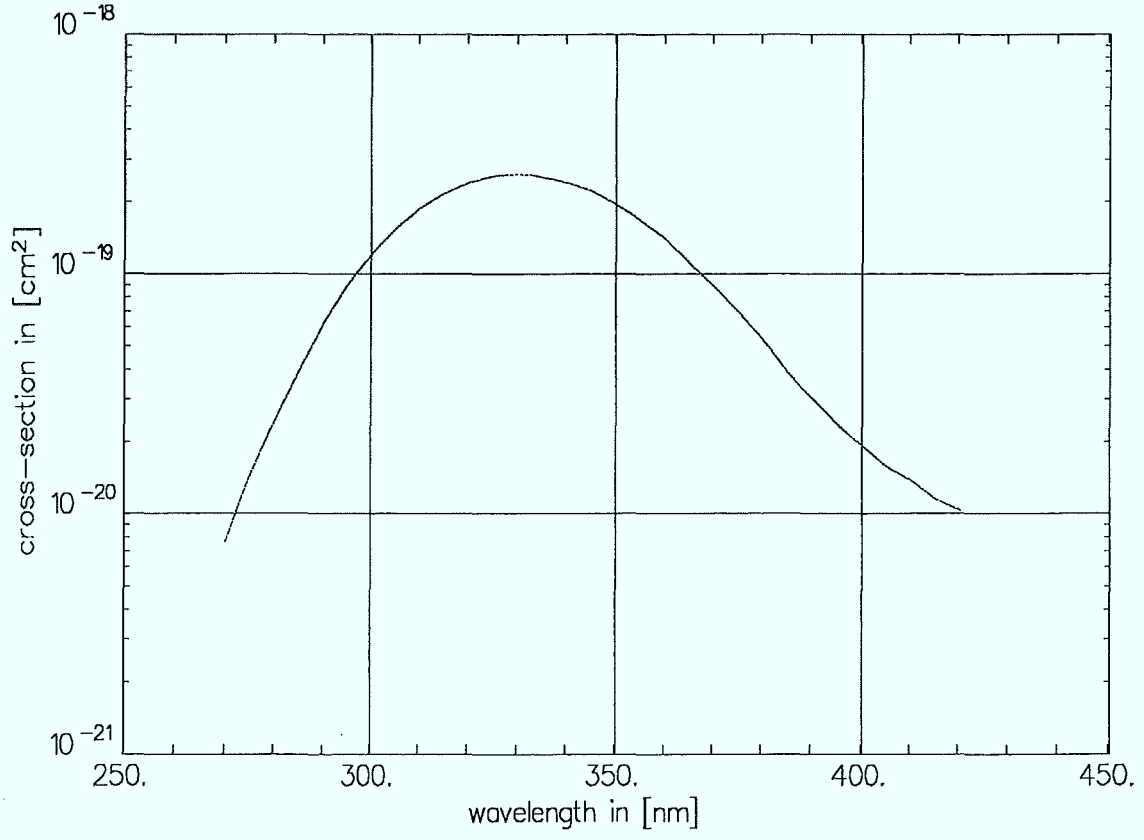
Substance: $Cl_2$

Reference:
Burkholder, J.B., and E.J. Bair, Potential Energy Parameters and Shapes of the Vibrational Components of the 345-nm System of Chlorine, J. Phys. Chem., **87** (1983), 1859-1863

Data: table Resolution: 2.5- 5.0 nm

Temperature: 301. K

Temperature dependence: 301. / 195. K



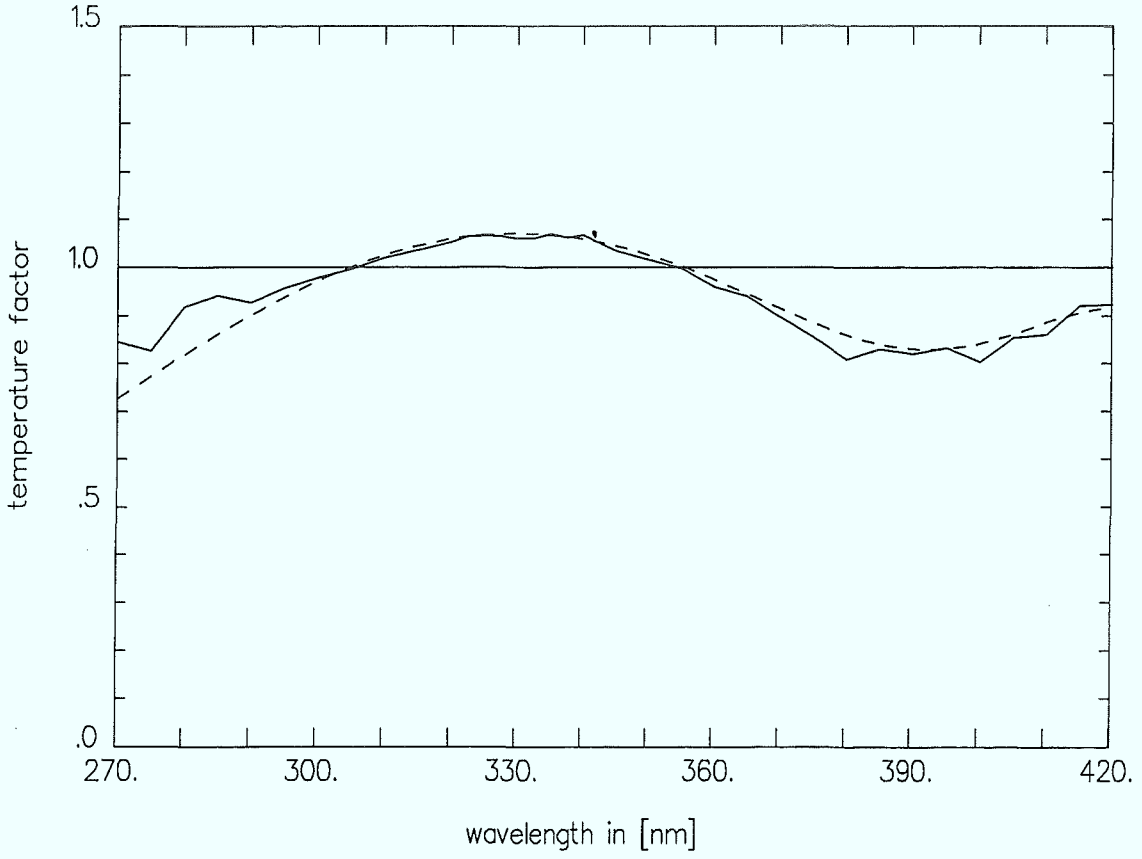
Substance: $Cl_2$

Reference:
Burkholder, J.B., and E.J. Bair, Potential Energy Parameters and Shapes of the Vibrational Components of the 345-nm System of Chlorine, J. Phys. Chem., **87** (1983), 1859-1863

Temperatures: 301. / 195. K

Function: 6

Fit Parameter: a = 6.6E-4 $\lambda_{00}$ = 355. $\lambda_0$ = 330.
c = 0.52 d = -10. e = -1.E-3 $\lambda_1$ = 430. f = 0.



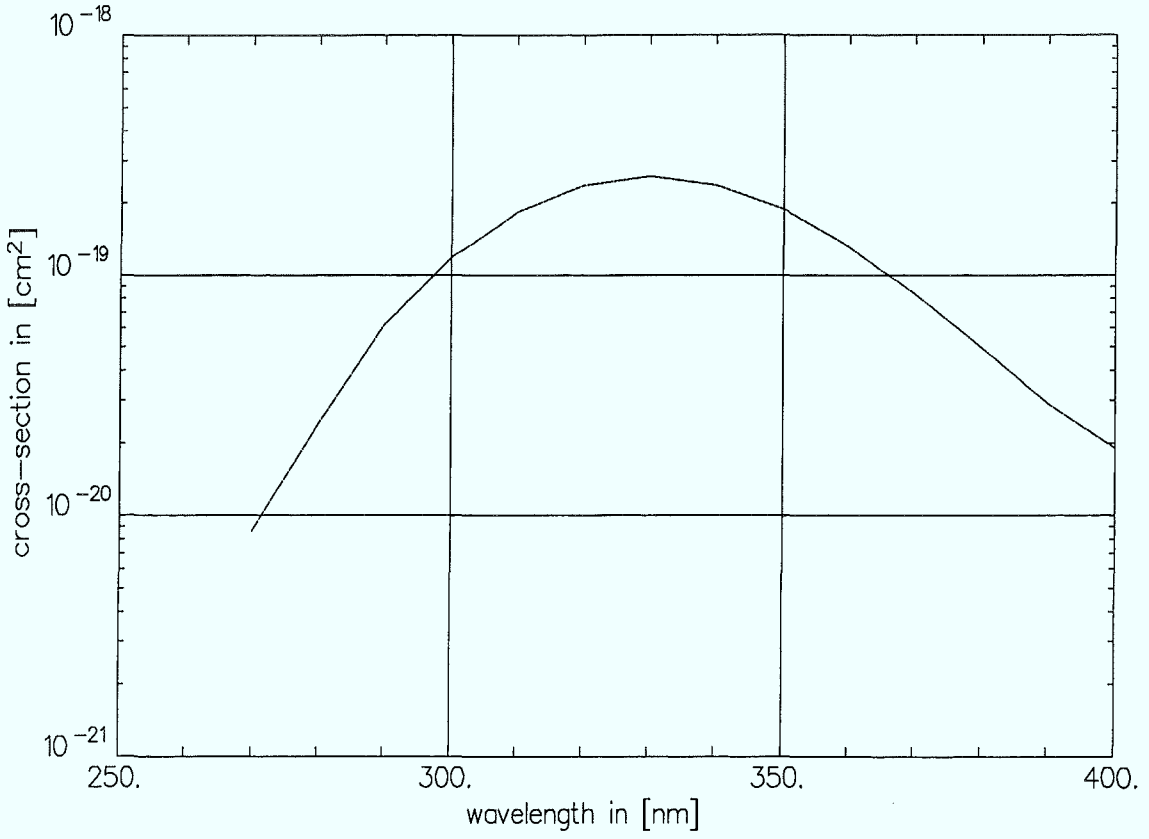
Substance: $Cl_2$

Reference:
Ganske, J.A., H.N. Berko, and B.J. Finlayson-Pitts, Absorption Cross Sections for Gaseous $ClNO_2$ and $Cl_2$ at 298 K: Potential Organic Oxidant Source in the Marine Troposphere, J. Geophys. Res., **97** (1992), 7651-7656

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



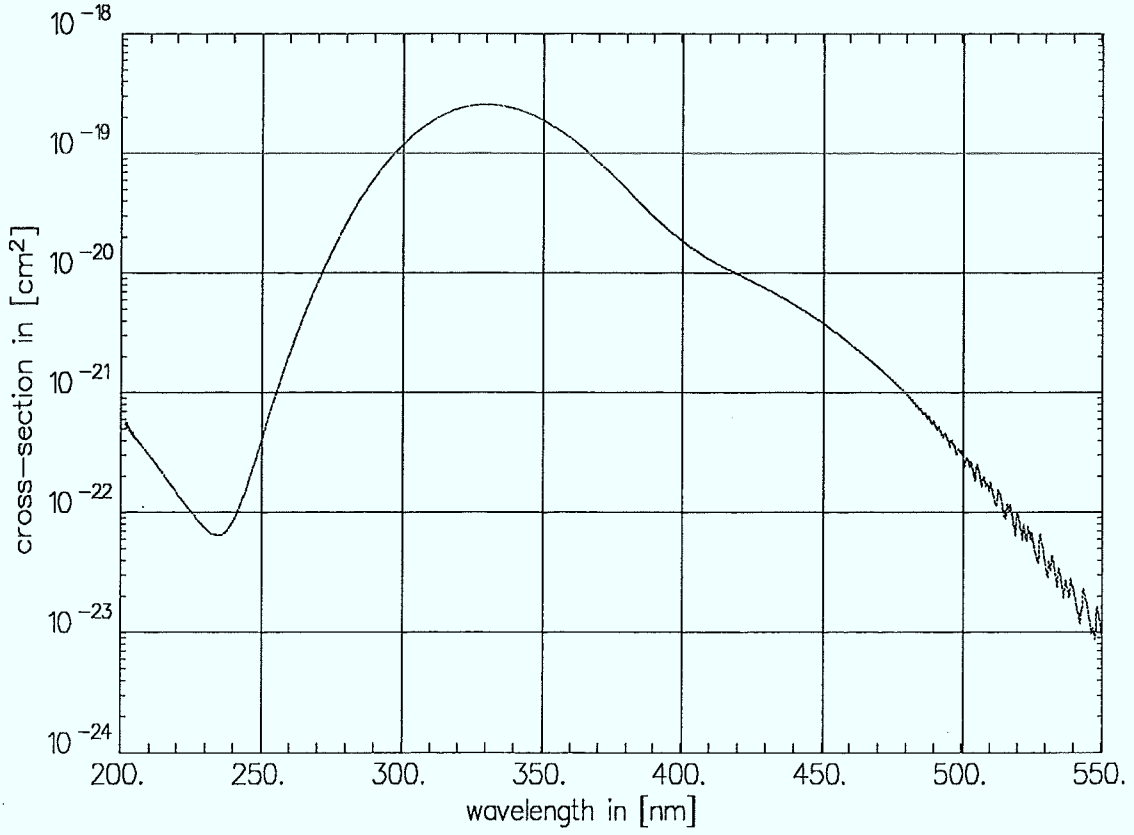
Substance: $Cl_2$

Reference:
Maric, D., J.P. Burrows, R. Meller, and G.K. Moortgat, A Study of the UV-Visible Absorption Spectra of Molecular Chlorine, J. Photochem. Photobiol. A: Chem., **70** (1993), 205-214

Data: disk Resolution: 0.067 nm

Temperature: 298. K

Temperature dependence: no



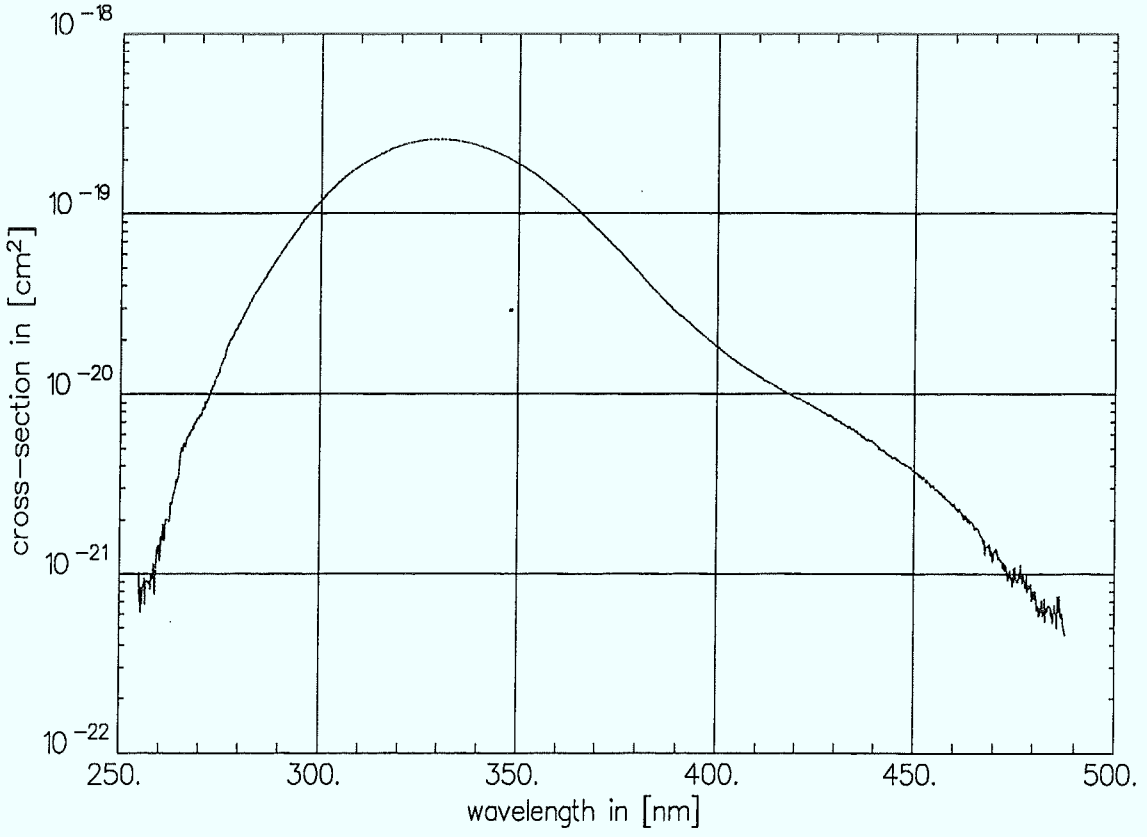
Substance: $Cl_2$

Reference:
Maric, D., J.P. Burrows, R. Meller, and G.K. Moortgat, A Study of the UV-Visible Absorption Spectra of Molecular Chlorine, J. Photochem. Photobiol. A: Chem., **70** (1993), 205-214

Data: disk Resolution: 0.2 nm

Temperature: 298. K

Temperature dependence: no



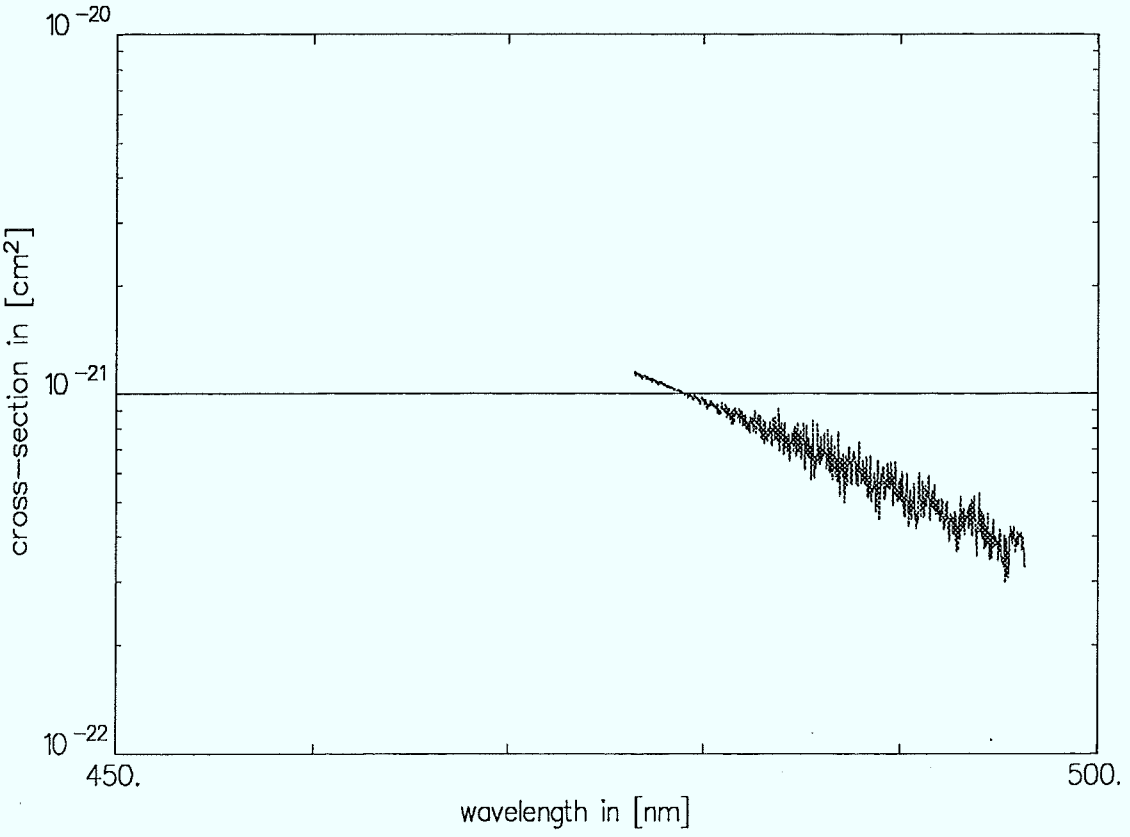
Substance: $Cl_2$

Reference:
Maric, D., J.P. Burrows, R. Meller, and G.K. Moortgat, A Study of the UV-Visible Absorption Spectra of Molecular Chlorine, J. Photochem. Photobiol. A: Chem., **70** (1993), 205-214

Data: disk Resolution: 0.009 nm

Temperature: 298. K

Temperature dependence: no



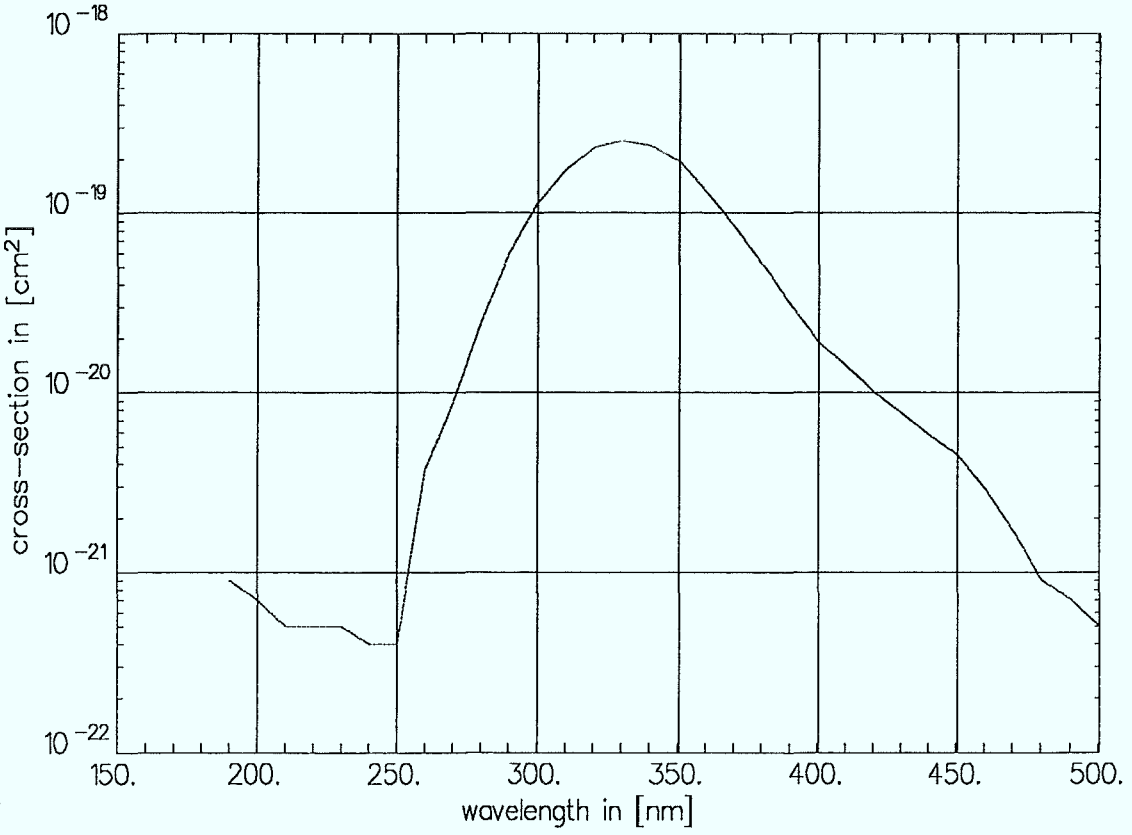
Substance: $Cl_2$

Reference:
Hubinger, S., and J.B. Nee, Absorption Spectra of $Cl_2$, $Br_2$ and BrCl between 190 and 600 nm, J. Photochem. Photobiol., **86** (1995), 1-7

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



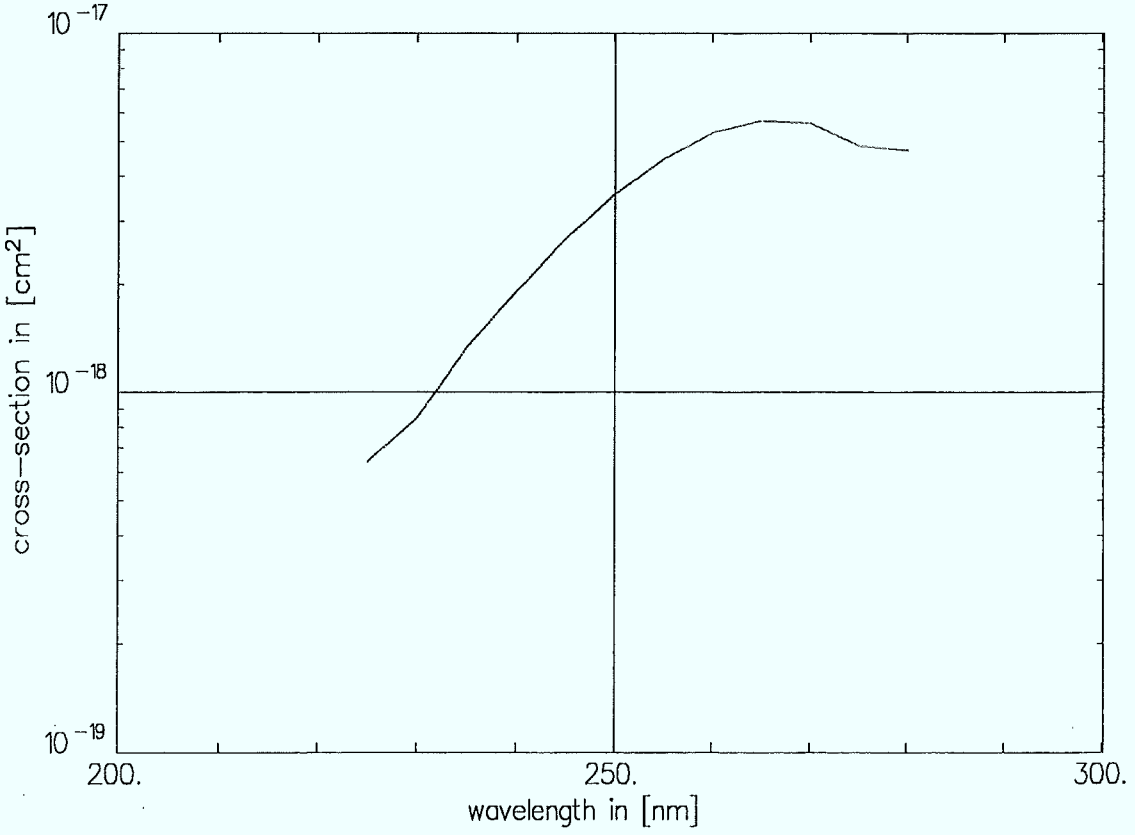
Substance: **ClO**

Reference:
Johnston, H.S., E.D. Morris, and J. Van den Bogaerde, Molecular Modulation Kinetic Spectrometry. ClOO and $ClO_2$ Radicals in the Photolysis of Clorine in Oxygen, J. Am. Chem. Soc., **91** (1969), 7712-7727

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



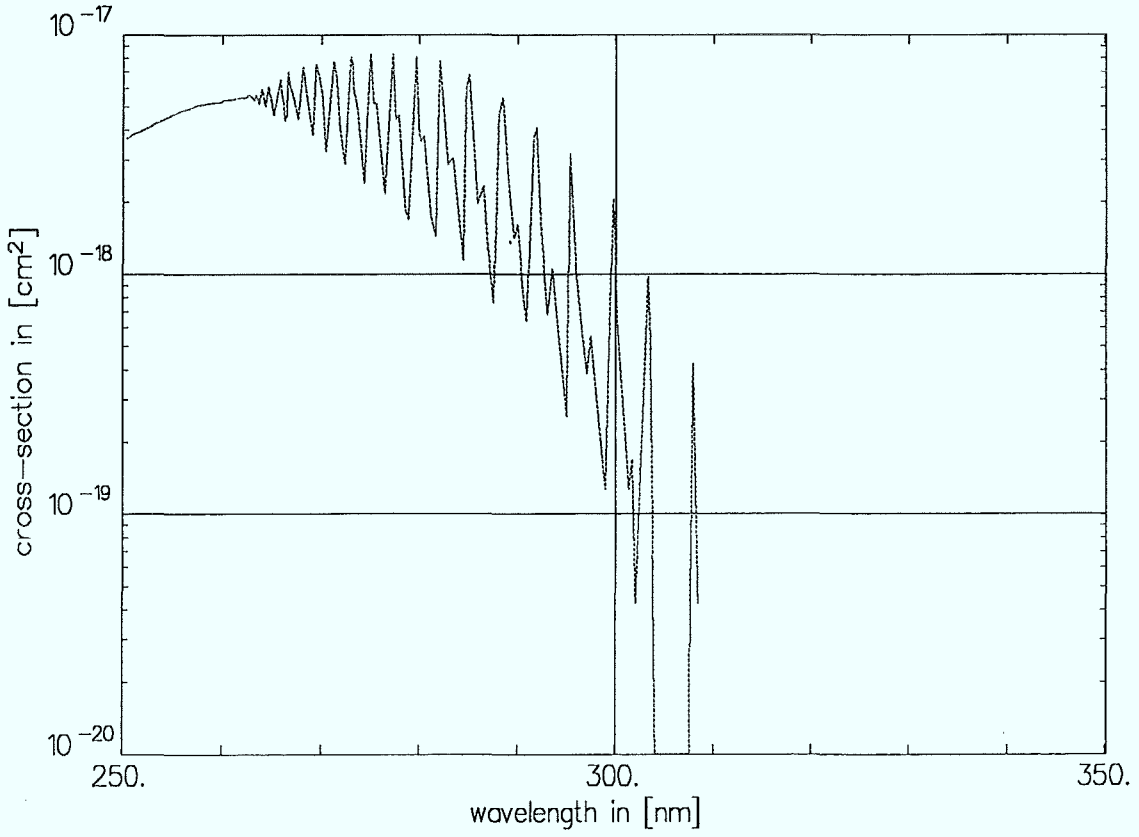
Substance: **ClO**

Reference:
Mandelman, M., and R.W. Nicholls, the Absorption Cross Section and f-values for the v''=0 Progression of Bands and Associated Continuum for the ClO ($A^2\Pi_i$-$X^2\Pi_i$) System, J. Quant. Spectrosc. Radiat. Transfer, **17** (1977), 483-491

Data: diagram

Temperature: 298. K

Temperature dependence: no



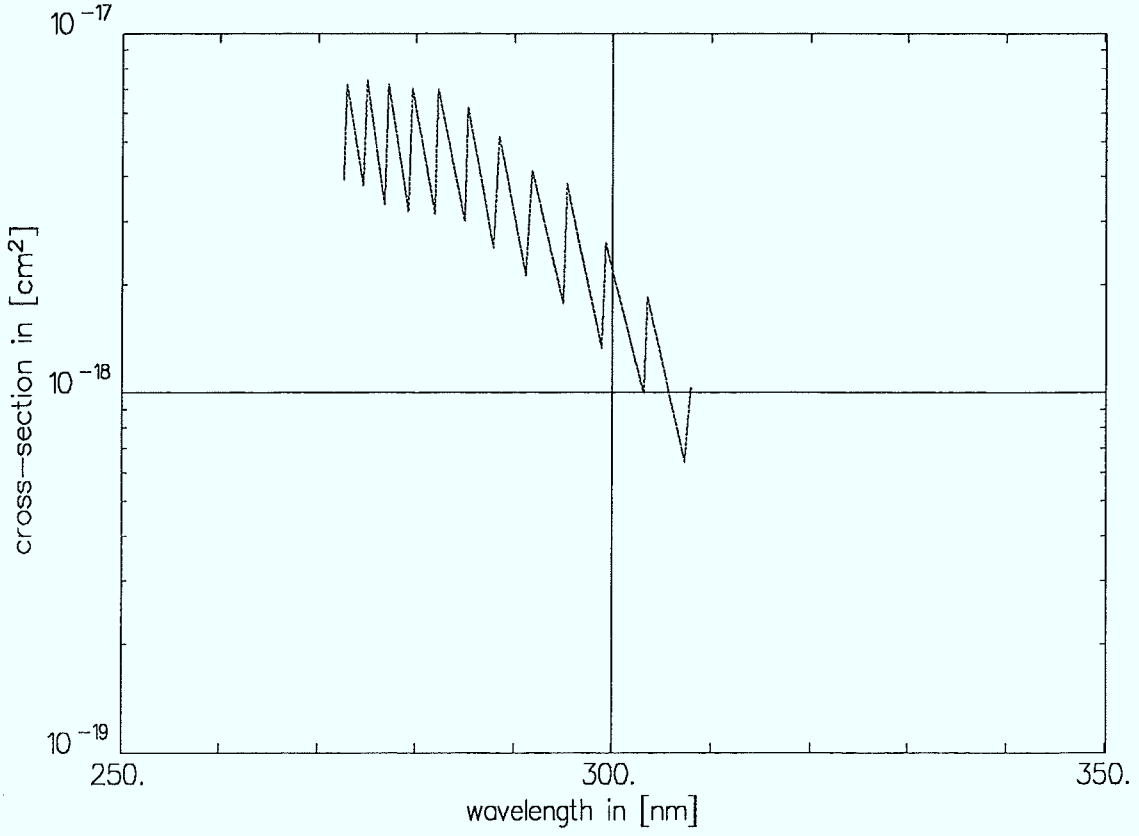
Substance: **ClO**

Reference:
Rigaud, P., B. Leroy, G. Le Bras, G. Poulet, J.L. Jourdain, and J. Combourieu, About the Identification of Some UV Atmospheric Absorptions: Laboratory Study of ClO, **46** (1977), 161-163

Data: table Resolution: 0.3 - 5.6 nm

Temperature: 298. K

Temperature dependence: no



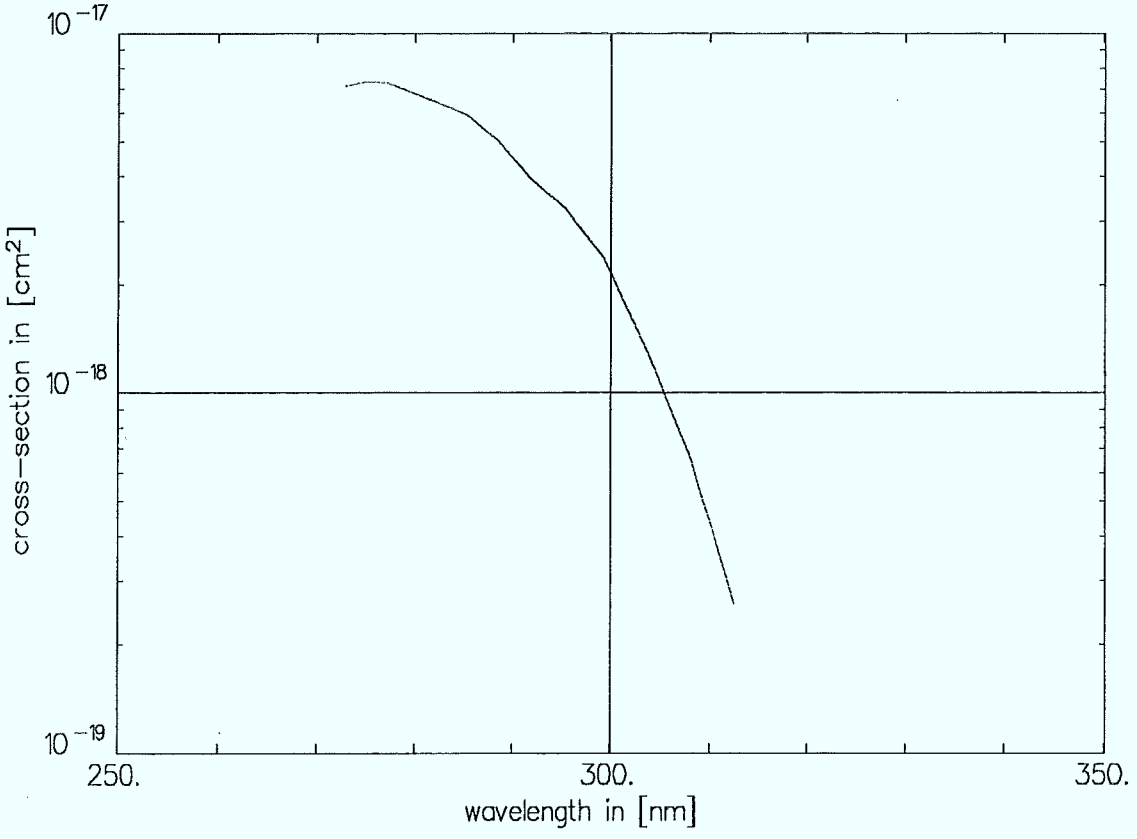
Substance: **ClO**

Reference:
Jourdain, J.L., G. Le Bras, G. Poulet, J. Combourieu, P. Rigaud, and B. Leroy, UV Absorption Spectrum Of ClO ($A^2\Pi$-$X^2\Pi$) up to the (1,0) Band, Chem. Phys. Lett., **57** (1978), 109-112

Data: table Resolution: 2.2 - 4.6 nm

Temperature: 298. K

Temperature dependence: no



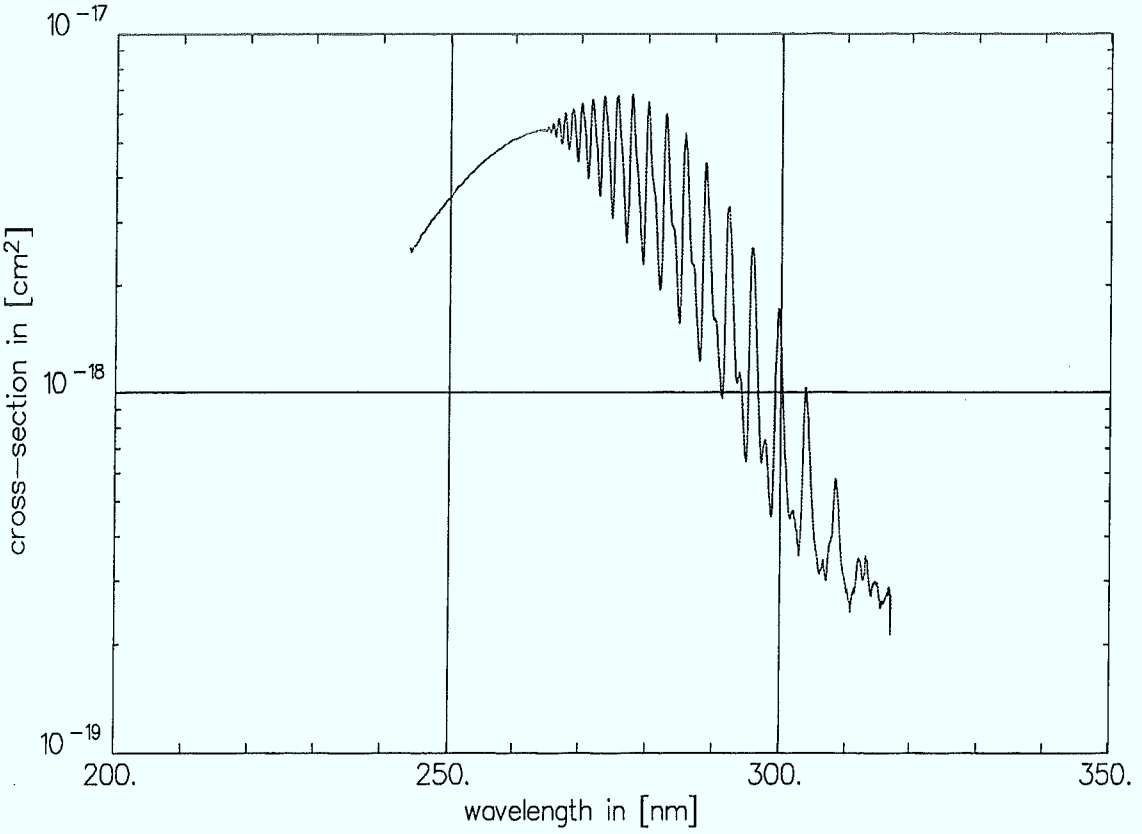
Substance: **ClO**

Reference:
Sander, S.P., and R.R. Friedl, Kinetics and Product Studies of the Reaction ClO + BrO Using Flash Photolysis-Ultraviolet Absorption, J. Phys. Chem., **93** (1989), 4764-4771

Data: disk Resolution: 0.1 nm

Temperature: 298. K

Temperature dependence: no



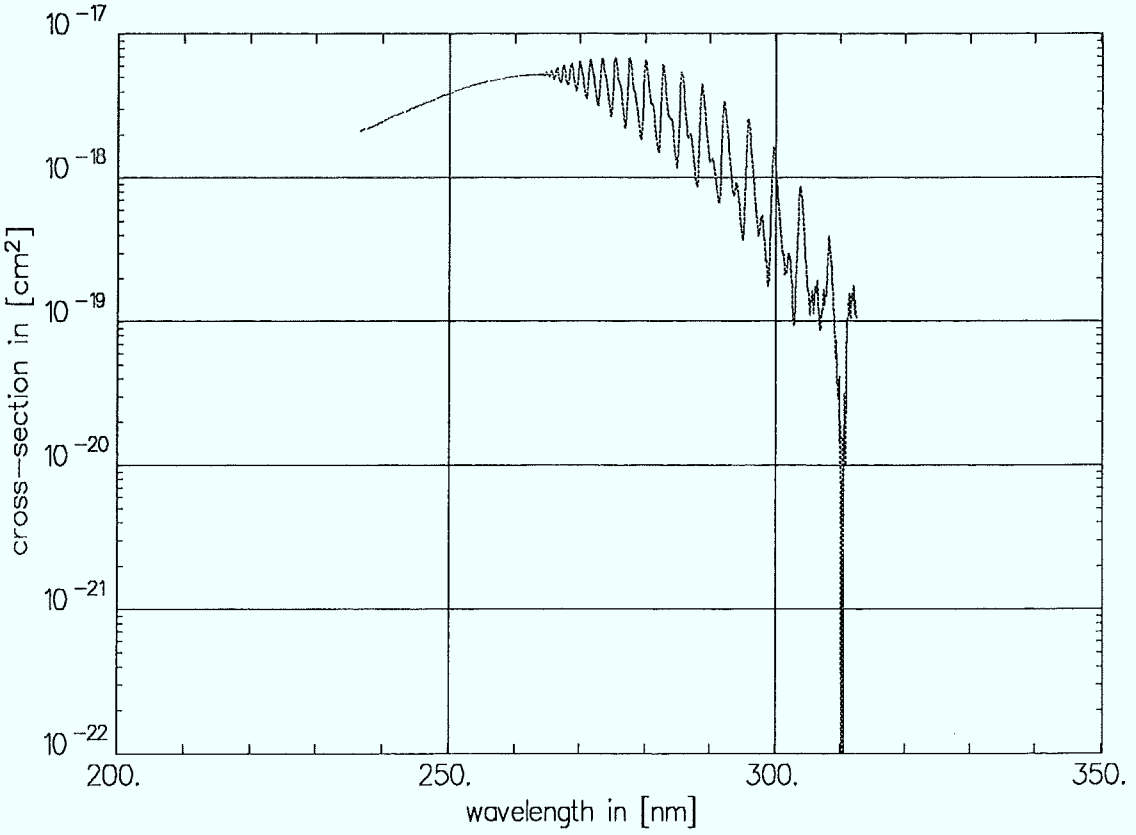
Substance: **ClO**

Reference:
Simon, F.G., W. Schneider, G.K. Moortgat, and J.P. Burrows, A Study of the ClO Absorption Cross-Section Between 240 and 310 nm and the Kinetics of the Self-Reaction at 300 K, J. Photochem. Photobiol., **55** (1990), 1-23

Data: disk Resolution: 0.08 nm

Temperature: 300. K

Temperature dependence: no



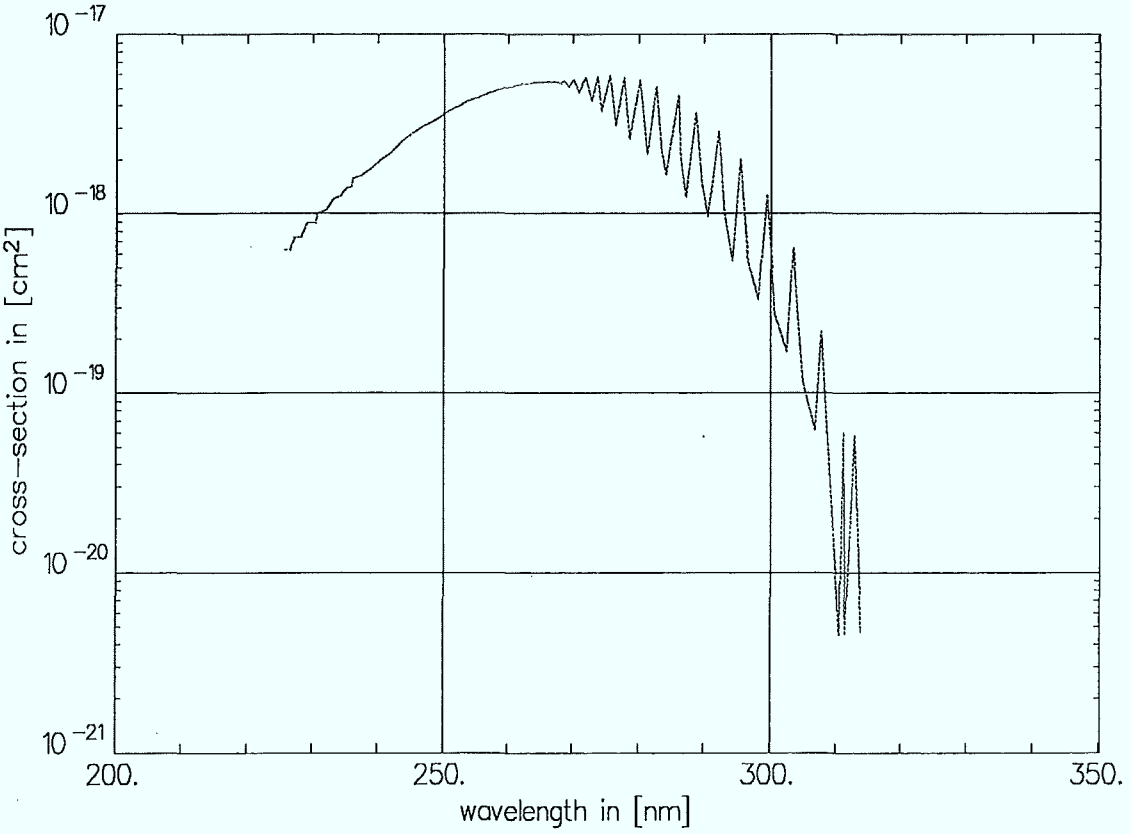
Substance: **ClO**

Reference:
Trolier, M., R.L. Mauldin III, and A.R. Ravishankara, Rate Coefficients for the Termolecular Channel of the Self-Reaction of ClO, J. Phys. Chem., **94** (1990), 4896-4907

Data: diagram

Temperature: 263. K

Temperature dependence: no



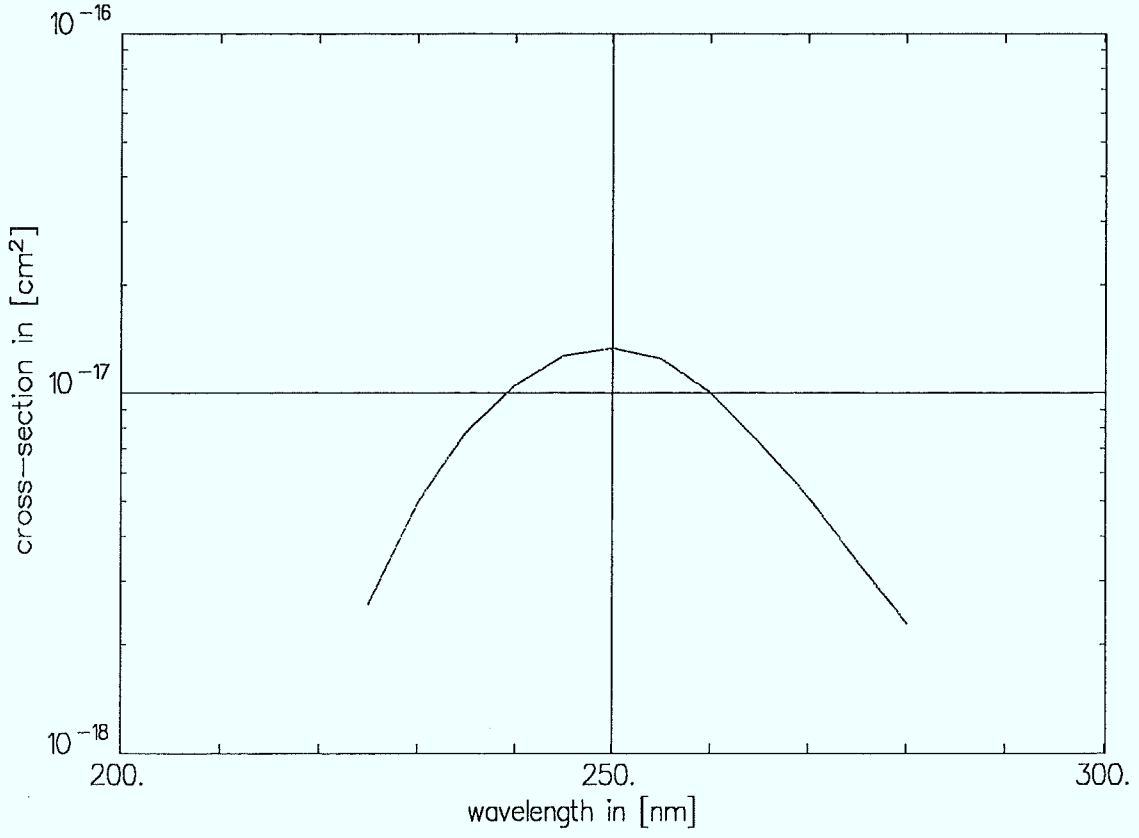
Substance: **ClOO**

Reference:
Johnston, H.S., E.D. Morris, and J. Van den Bogaerde, Molecular Modulation Kinetic Spectrometry. ClOO and $ClO_2$ Radicals in the Photolysis of Clorine in Oxygen, J. Am. Chem. Soc., **91** (1969), 7712-7727

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no



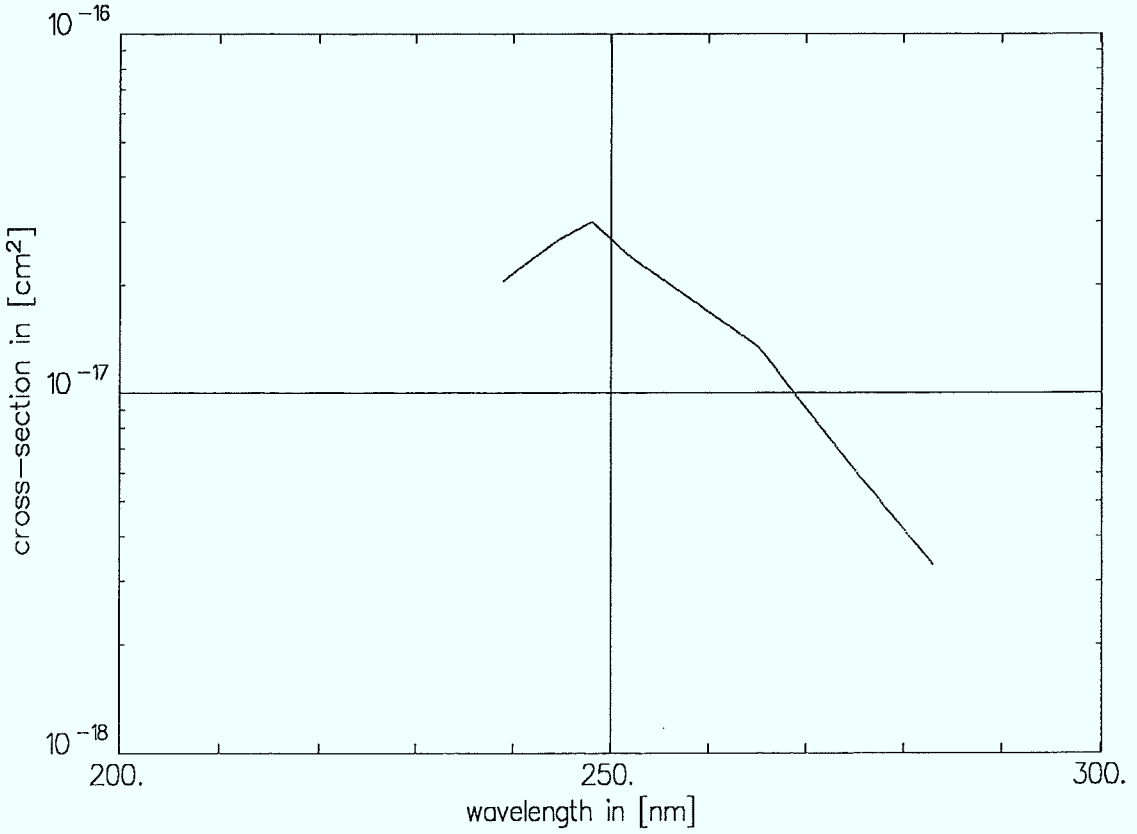
Substance: **ClOO**

Reference:
Baer, S., H. Hippler, R. Rahn, M. Siefke, N. Seitzinger, and J. Troe, Thermodynamic and Kinetic Properties of the Reaction Cl+$O_2$+M<=> ClOO+M in the range of 160-300K and 1-1000bar, J. Chem.Phys., **95** (1991), 6463-6470

Data: diagram

Temperature: 300. K

Temperature dependence: no



Substance: **ClOO**

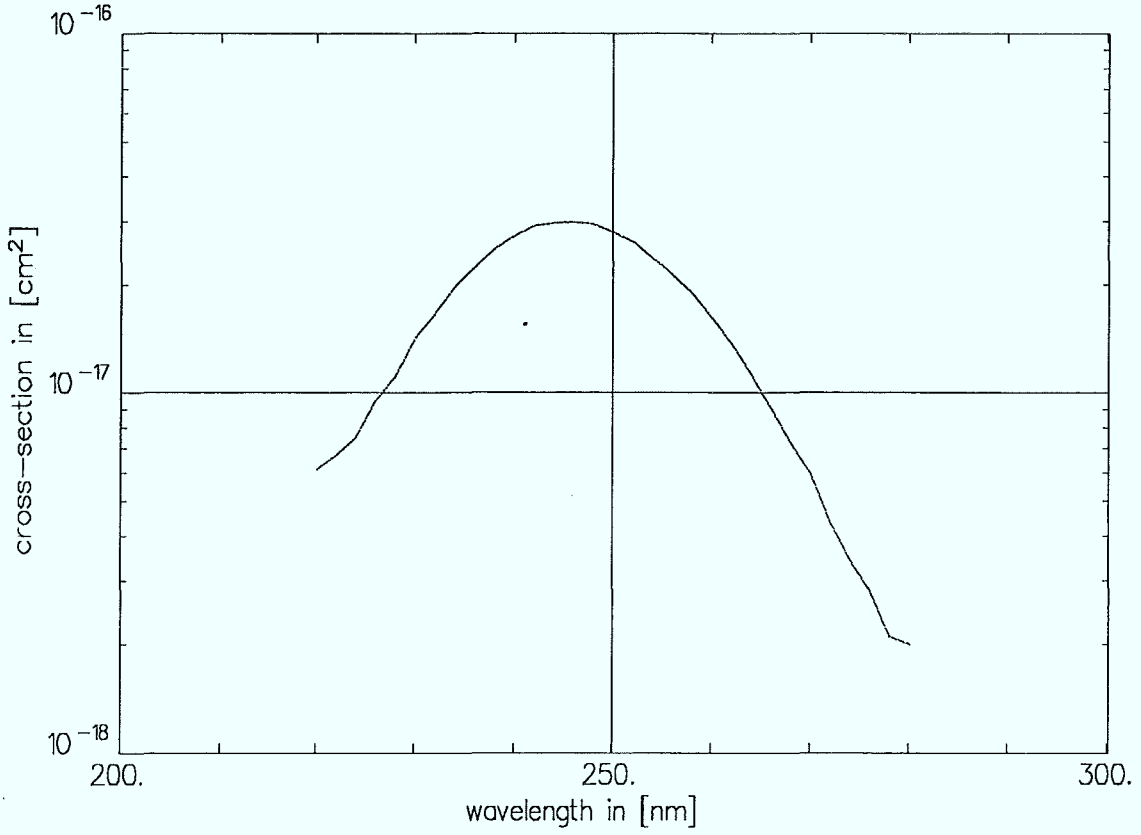
Reference:
Mauldin III, R.L., J.B. Burkholder, and A.R. Ravishankara, A Photochemical, Thermodynamic, and Kinetic Study of ClOO, J. Phys. Chem., **96** (1992), 2582-2588

Data: table Resolution: 2.0 nm

Temperature: 191. K

Temperature dependence: no

Comment: ClOO was prepared by photolysis of a $Cl_2/O_2$ mixture



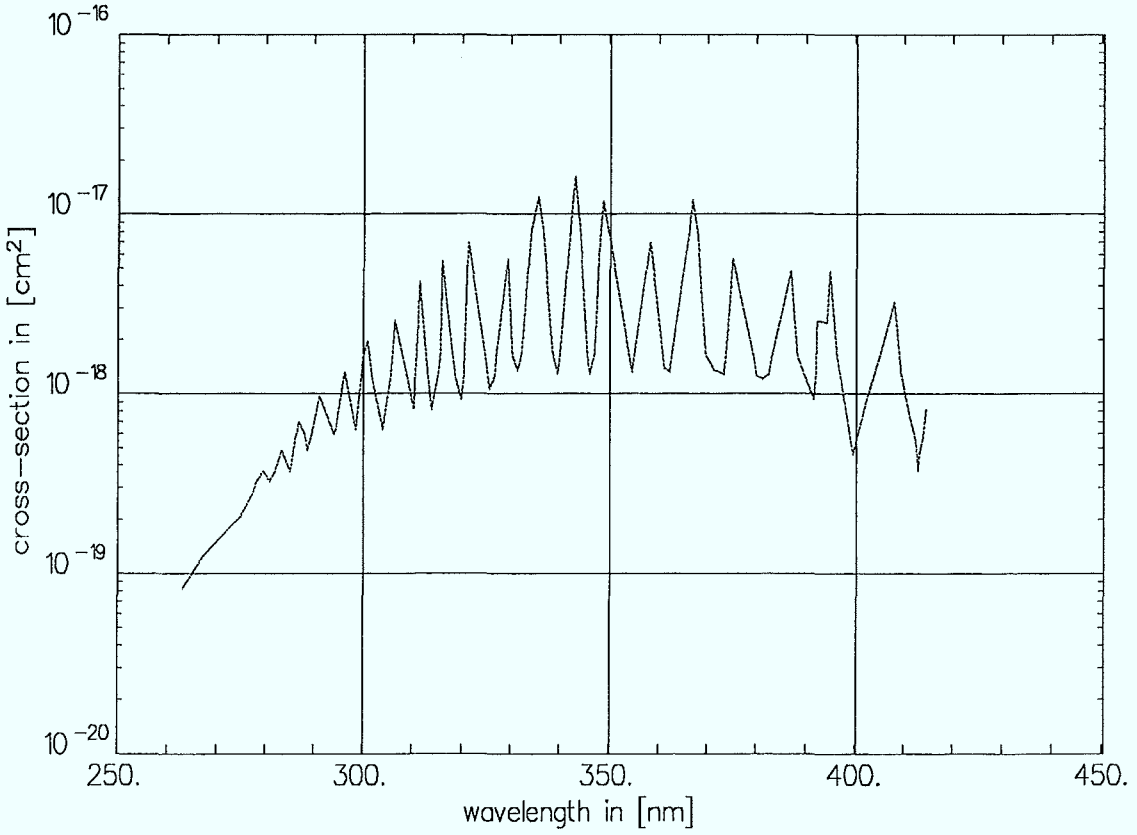
Substance: **OClO**

Reference:
Martin, H., and R. Gareis, Die Kinetik der Reaktion von $ClO_2$ mit $NO_2$ in der Lösungsphase, Z. Elektrochem., **60** (1956), 959-964

Data: diagram

Temperature: 298. K

Temperature dependence: no



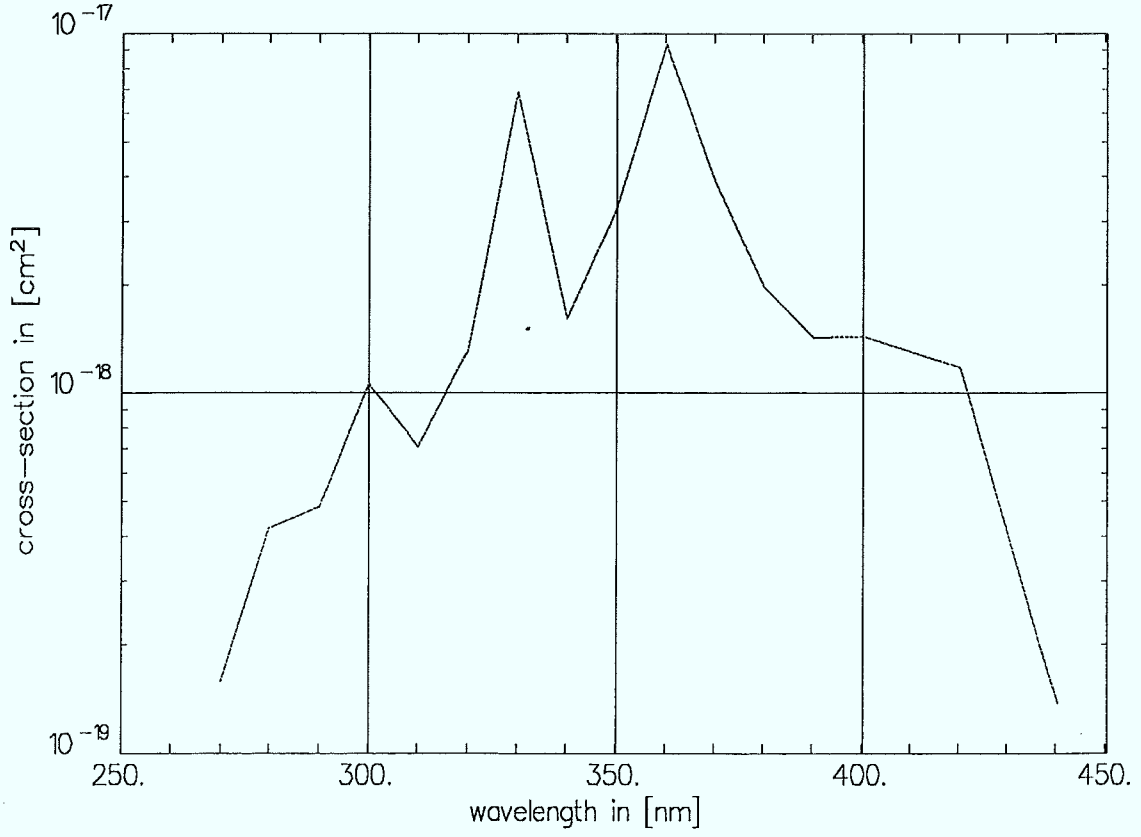
Substance: **OClO**

Reference:
Knauth, H.-D., H. Alberti, and H. Clausen, Equilibrium Constant of the Gas Reaction $Cl_2O + H_2O = 2HOCl$ and the Ultraviolet Spectrum of HOCl, J. Phys. Chem., **83** (1979), 1604-1612

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 333.. K

Temperature dependence: no



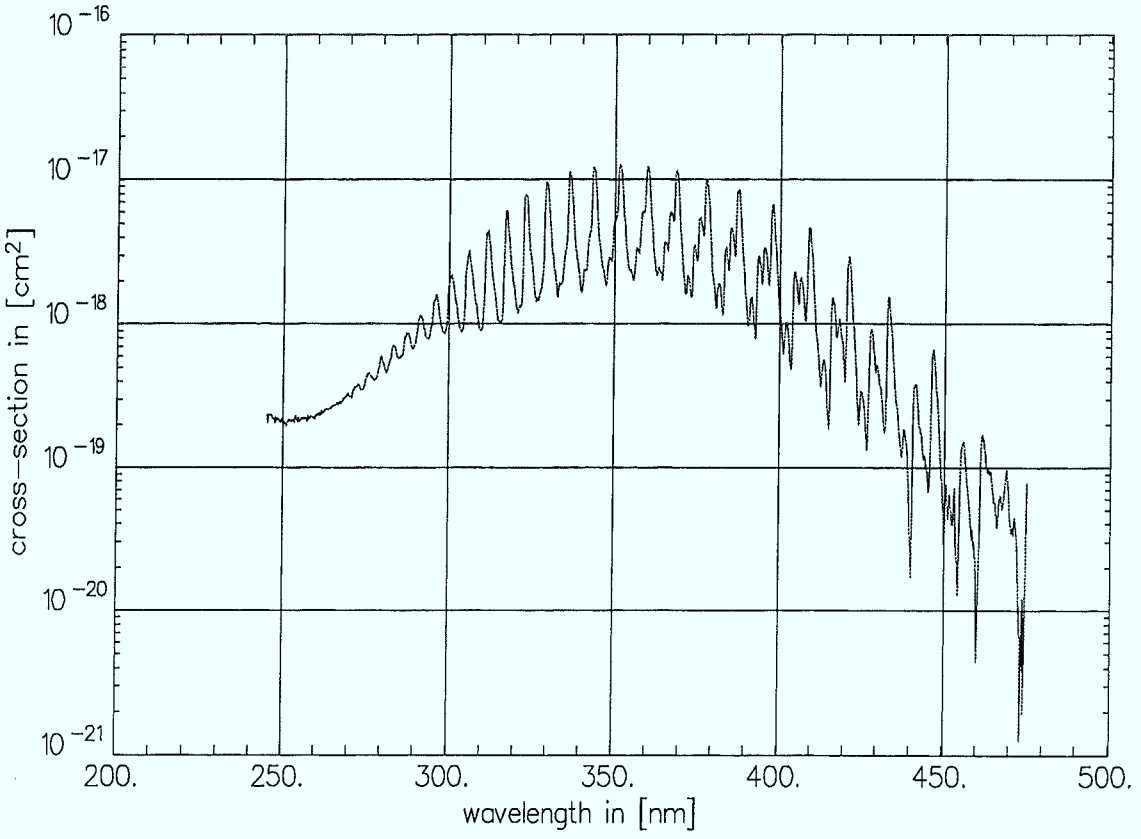
Substance: **OClO**

Reference:
Wahner, A., G.S. Tyndall, and A.R.Ravishankara, Absorption Cross Sections for OClO as a Function of Temperature in the Wavelength Range 240-480 nm, J. Phys. Chem., **91** (1987), 2734-2738

Data: disk Resolution: 0.22 nm

Temperature: 296. K

Temperature dependence: 296. / 204. K



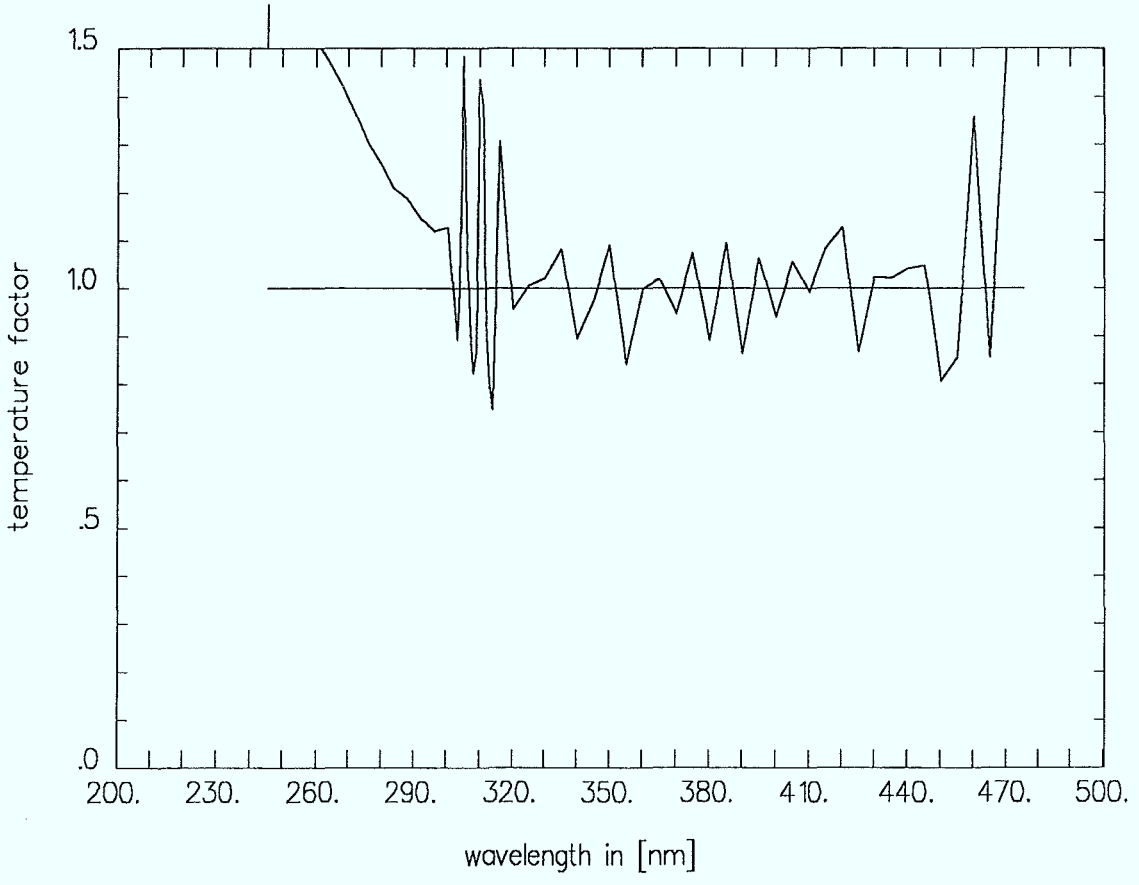
Substance: **OClO**

Reference:
Wahner, A., G.S. Tyndall, and A.R.Ravishankara, Absorption Cross Sections for OClO as a Function of Temperature in the Wavelength Range 240-480 nm, J. Phys. Chem., **91** (1987), 2734-2738

Temperatures: 298. / 204. K

Function: not fitted

Comment: Temperature dependence from reduced spectra.



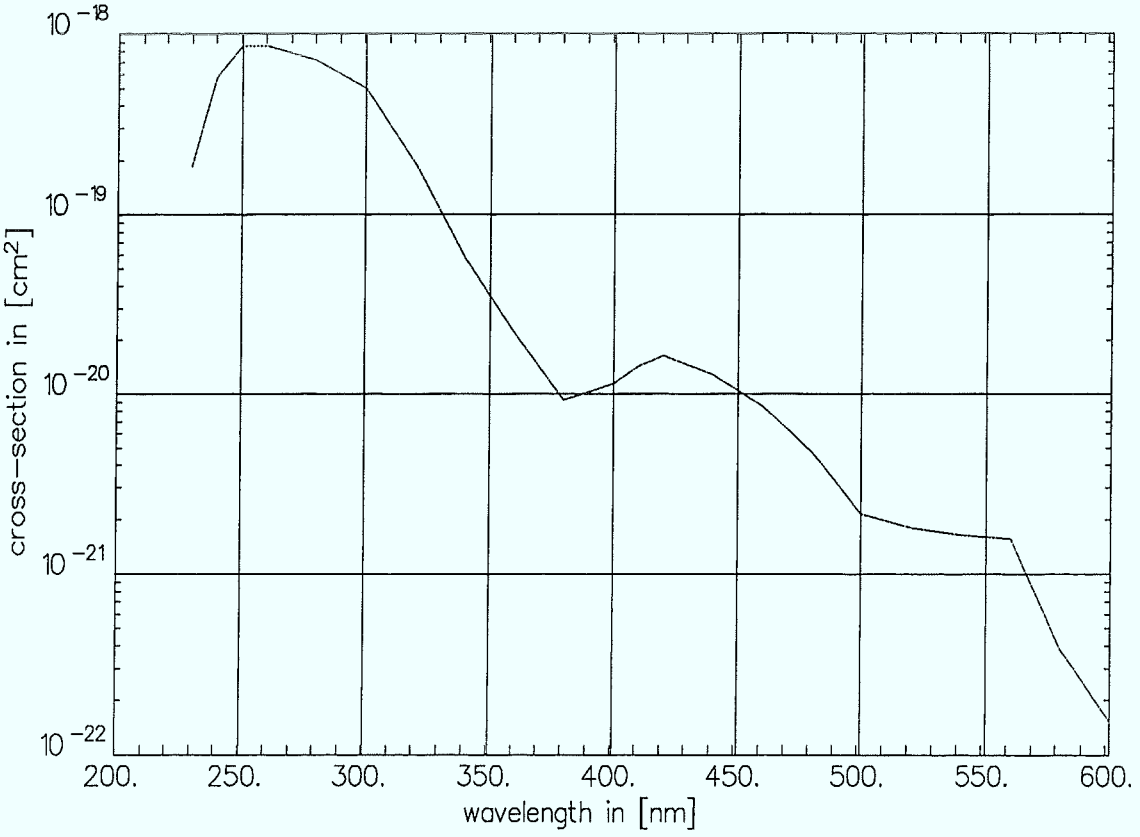
Substance: $Cl_2O$

Reference:
Goodeve, C.F, and J.I. Wallace, Trans. Faraday Soc., **26** (1930), 254

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 298. K

Temperature dependence: no



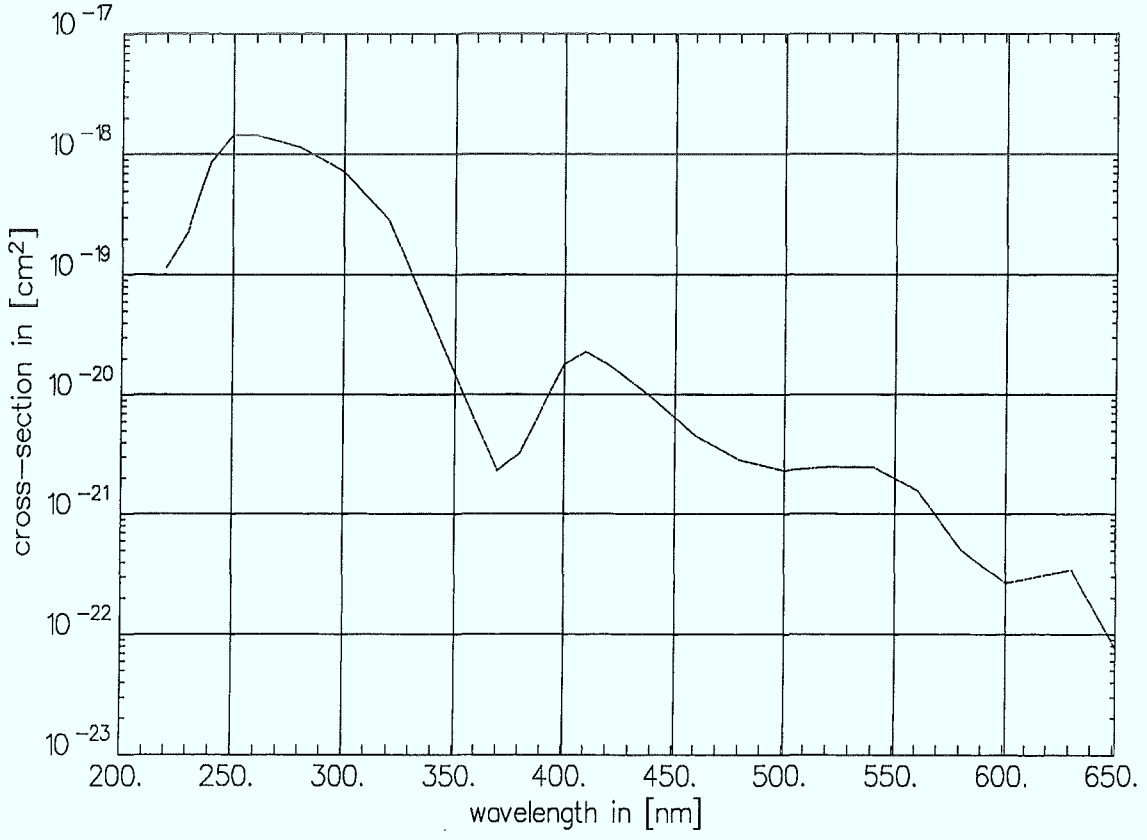
Substance: $Cl_2O$

Reference:
Finkelnburg, W., H.J. Schumacher, and G. Stieger, Das Spektrum und der photochemische Zerfall des Chlormonoxids, Z. Phys. Chem., **15** (1931), 127-156

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 298.. K

Temperature dependence: no



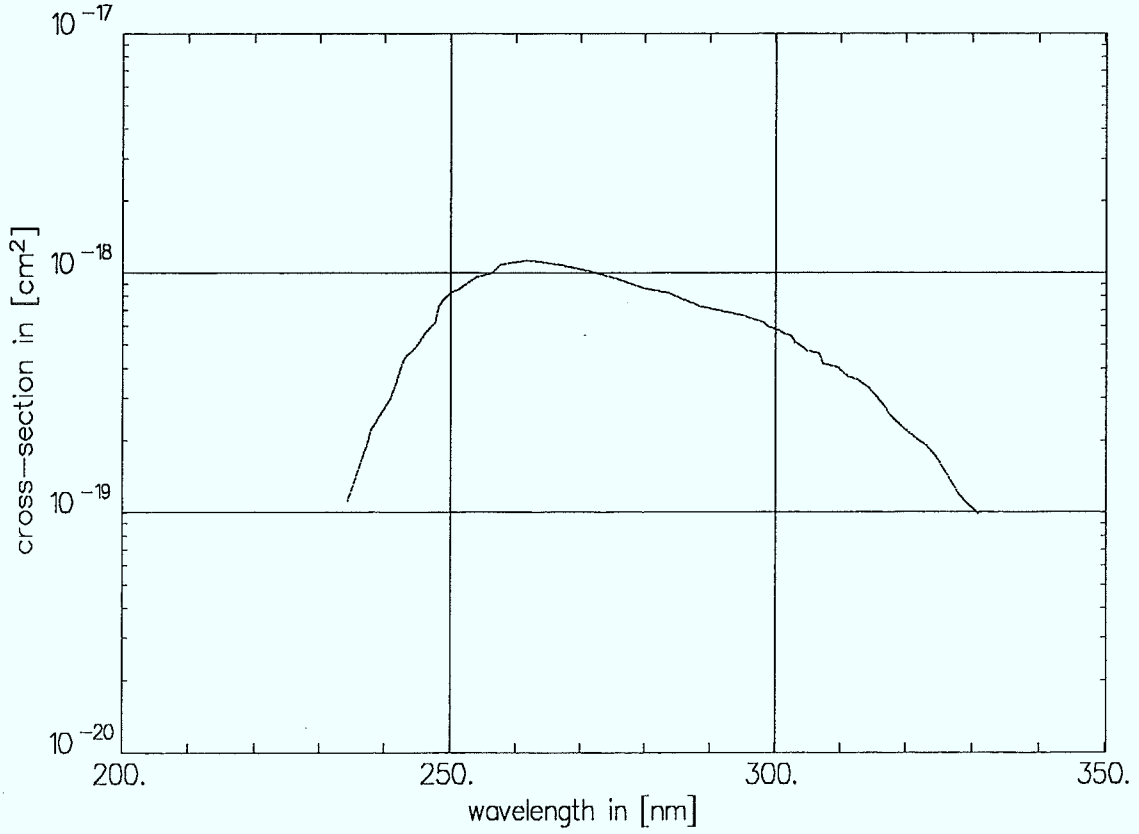
Substance: $Cl_2O$

Reference:
Martin, H., and R. Gareis, Die Kinetik der Reaktion von $ClO_2$ mit $NO_2$ in der Lösungsphase, Z. Elektrochem., **60** (1956), 959-964

Data: diagram

Temperature: 298. K

Temperature dependence: no



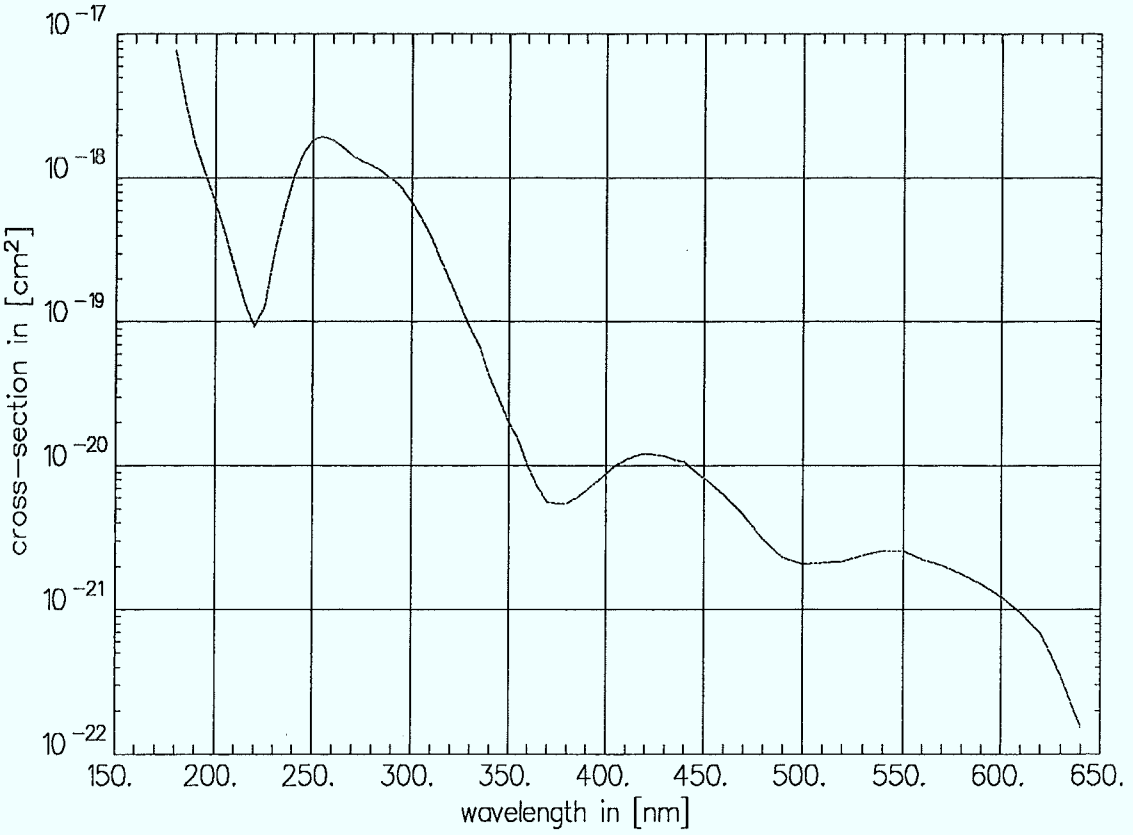
Substance: $Cl_2O$

Reference:
Lin, C.-L., Extinction Coefficients of Chlorine Monoxide and Chlorine Heptoxide, J. Chem. Eng. Data, **21** (1976), 411-413

Data: table Resolution: 5.0 - 10.0 nm

Temperature: 298. K

Temperature dependence: no



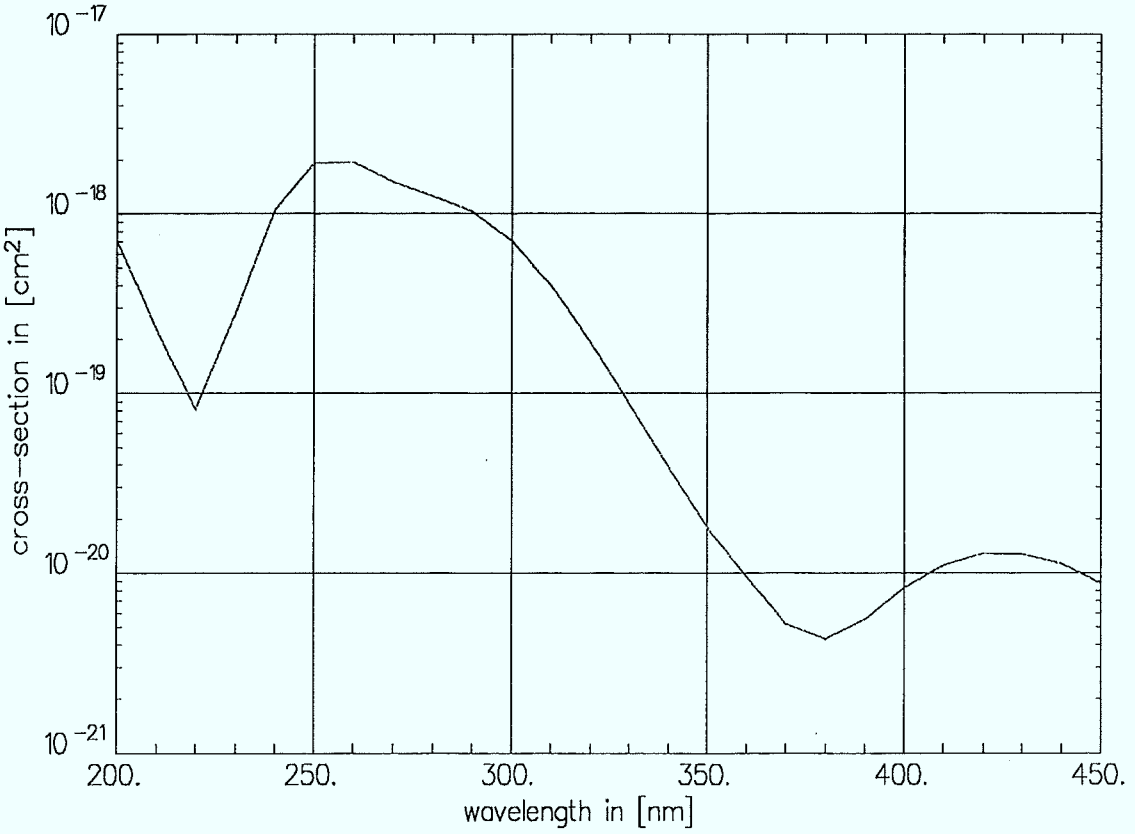
Substance: $Cl_2O$

Reference:
Molina, L.T., and M.J. Molina, Ultraviolet Spectrum of HOCl, J. Phys. Chem., **82** (1978), 2410-2414

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



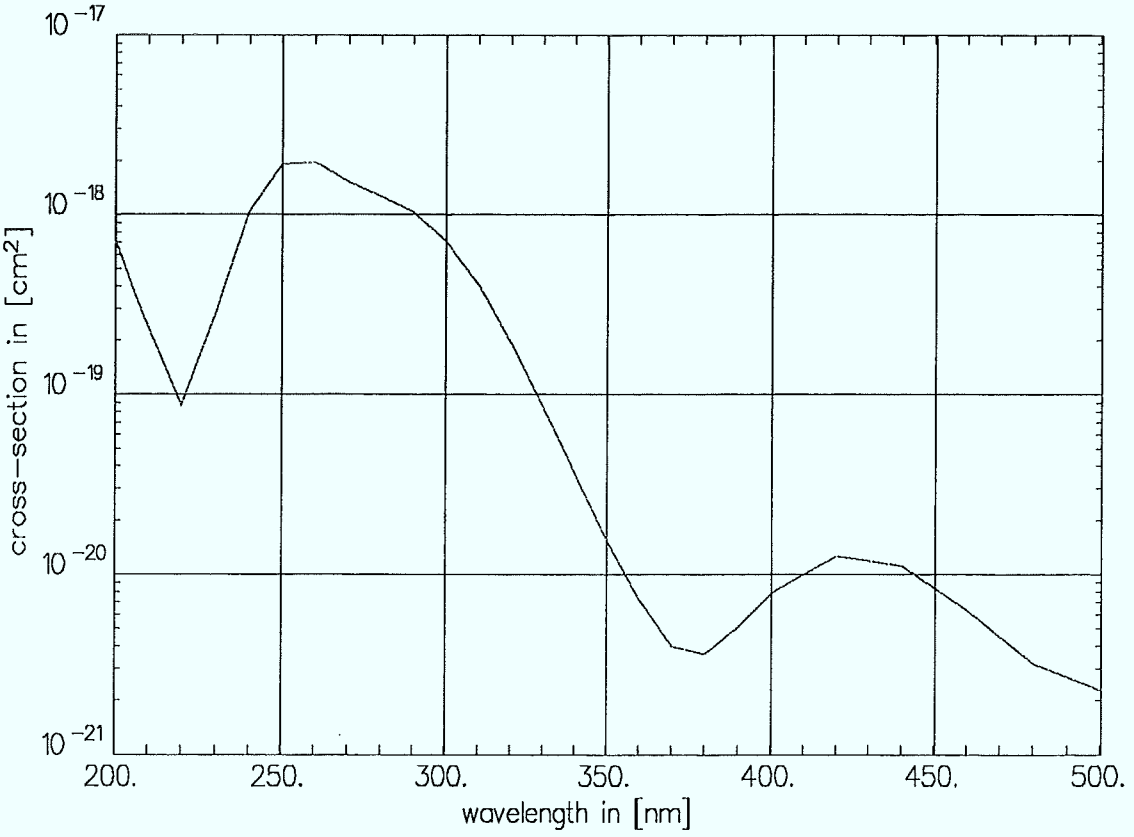
Substance: $Cl_2O$

Reference:
Knauth, H.-D., H. Alberti, and H. Clausen, Equilibrium Constant of the Gas Reaction $Cl_2O + H_2O = 2HOCl$ and the Ultraviolet Spectrum of HOCl, J. Phys. Chem., **83** (1979), 1604-1612

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 298. K

Temperature dependence: 298. / 333. K



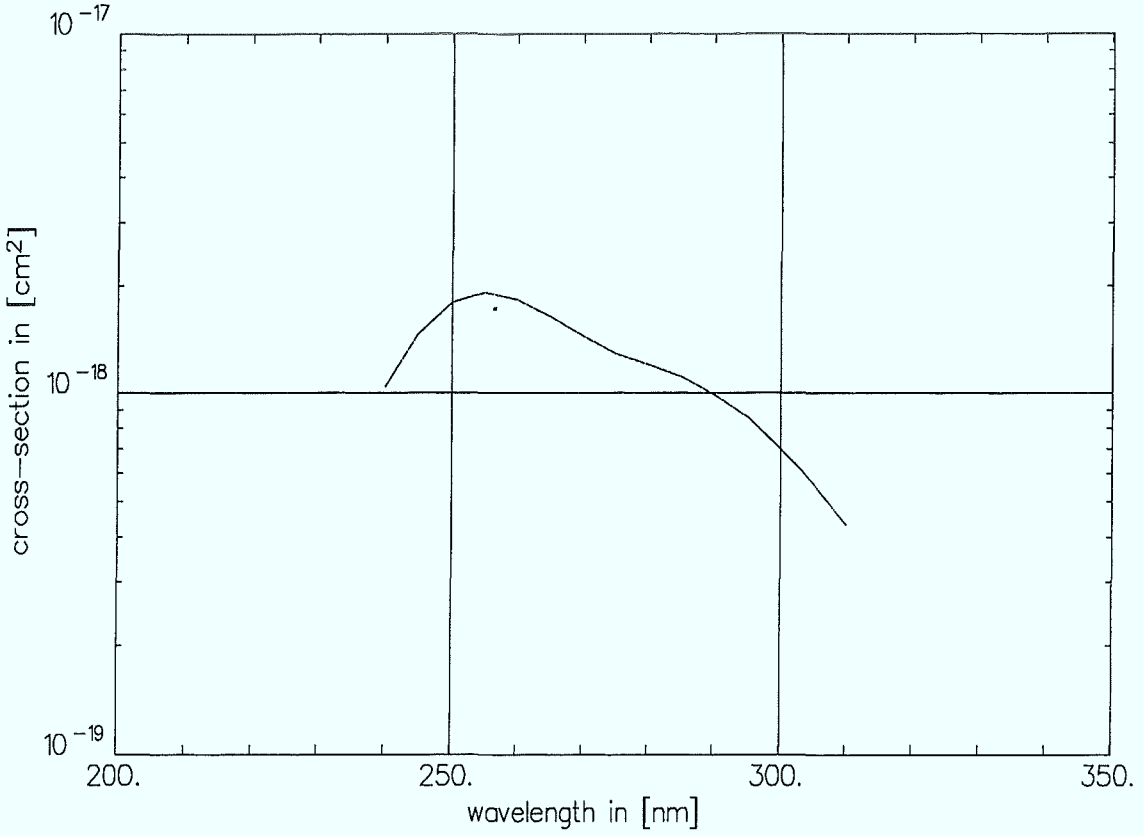
Substance: $Cl_2O$

Reference:
Simon, F.G., W. Schneider, G.K. Moortgat, and J.P. Burrows, A Study of the ClO Absorption Cross-Section Between 240 and 310 nm and the Kinetics of the Self-Reaction at 300 K, J. Photochem. Photobiol., **55** (1990), 1-23

Data: table Resolution: 5.0 nm

Temperature: 300. K

Temperature dependence: no



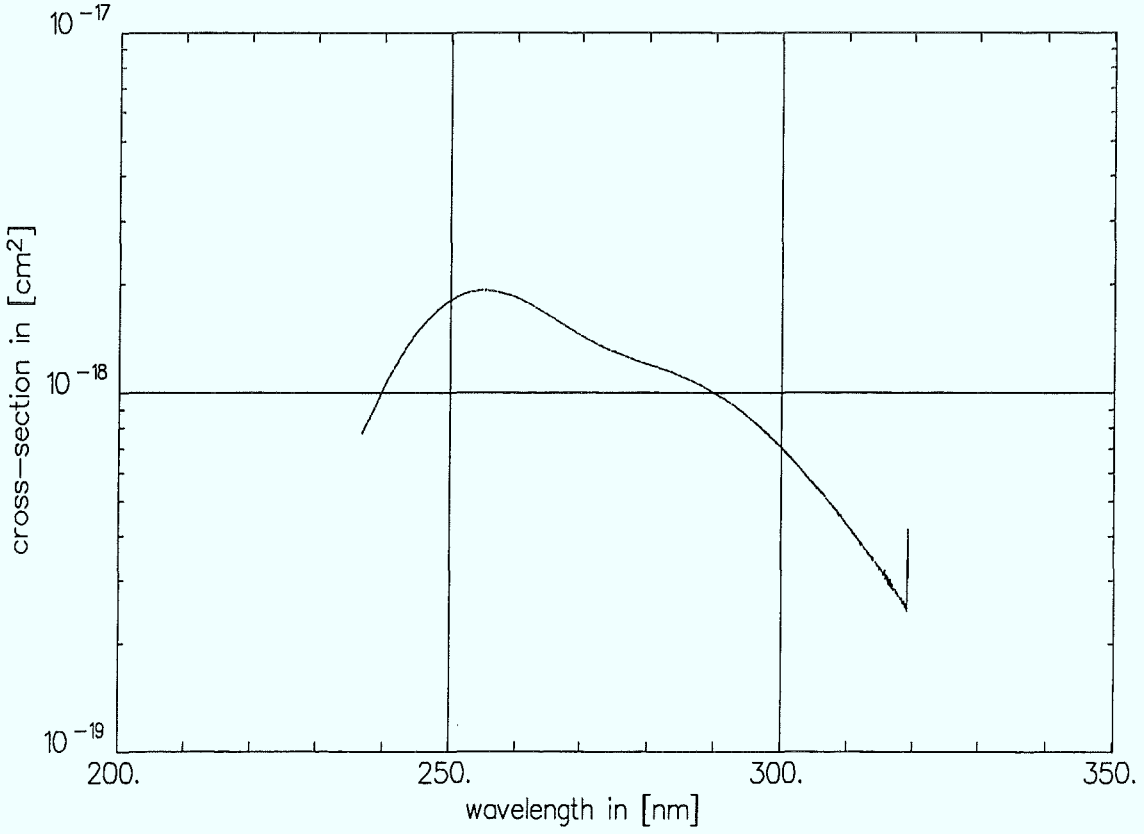
Substance: $Cl_2O$

Reference:
Simon, F.G., Ph.D.-Thesis, University of Mainz, Germany, 1989

Data: disk Resolution: 0.08 nm

Temperature: 300. K

Temperature dependence: no



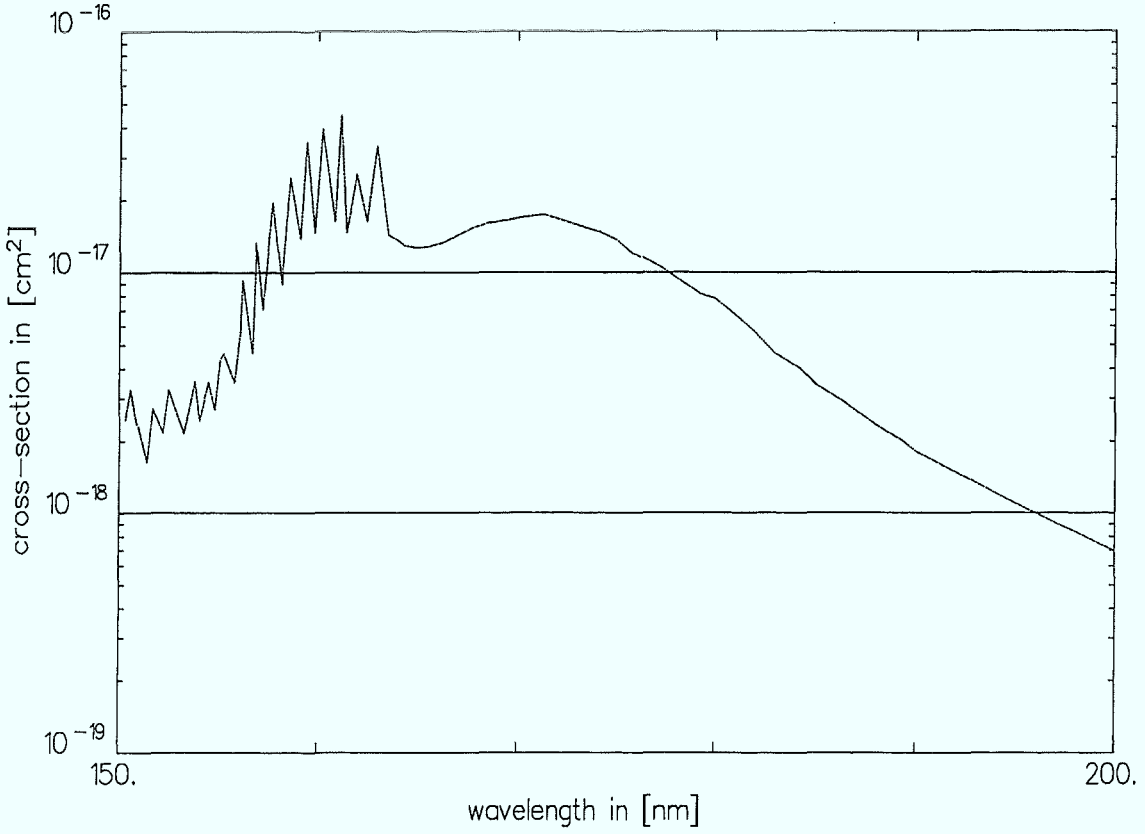
Substance: $Cl_2O$

Reference:
Nee, J.B., Ultraviolet Absorption of $Cl_2O$, J. Quant. Spectros. Radiat. Transfer, **46** (1991), 55-58

Data: diagram

Temperature: 298. K

Temperature dependence: no



Substance: $Cl_2O_2$

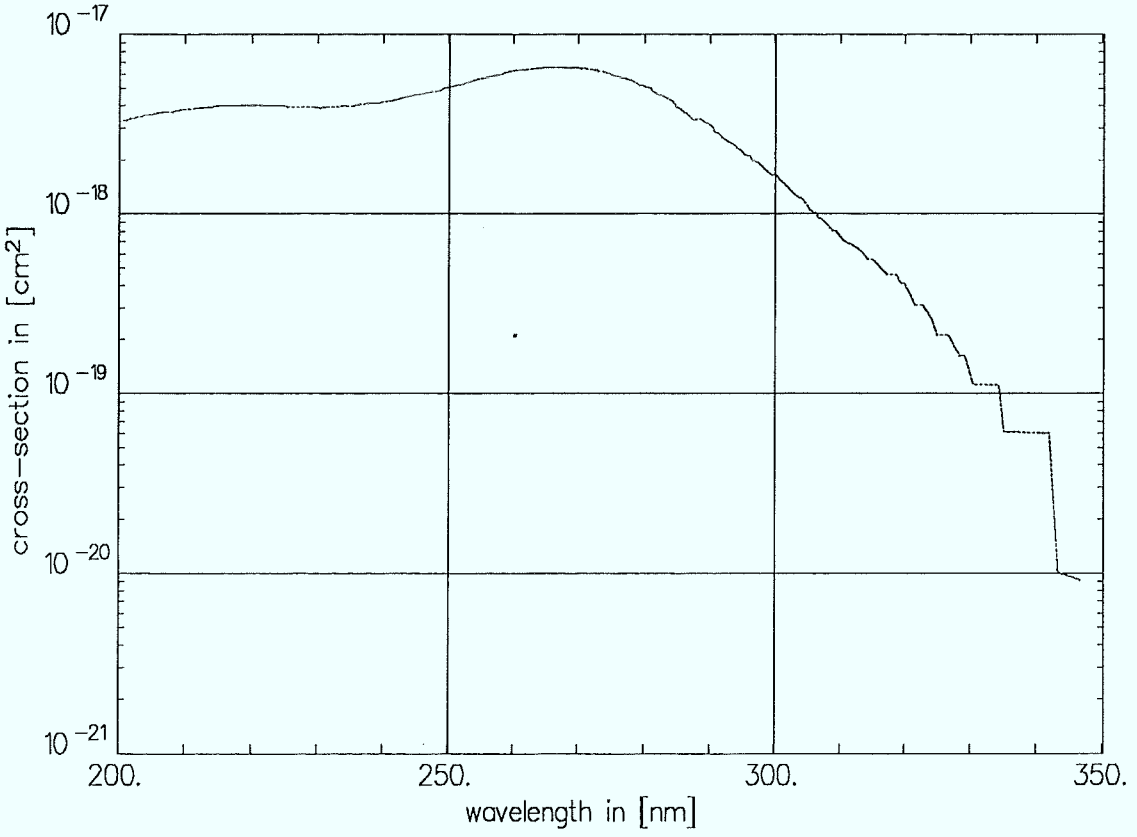
Reference:
Molina, L.T., and M.J. Molina, Production of $Cl_2O_2$ from the Self-Reaction of the ClO Radical, J. Phys. Chem., **91** (1987), 433-436

Data: diagram

Temperature: 240. K

Temperature dependence: no

Comment: $Cl_2O_2$ was formed from the three body association of two ClO radicals (ClO+ClO+M-> $Cl_2O_2$+M). ClO radicals were generated by reaction of Cl with an excess of $O_3$, OClO or $Cl_2O$.



Substance: $Cl_2O_2$

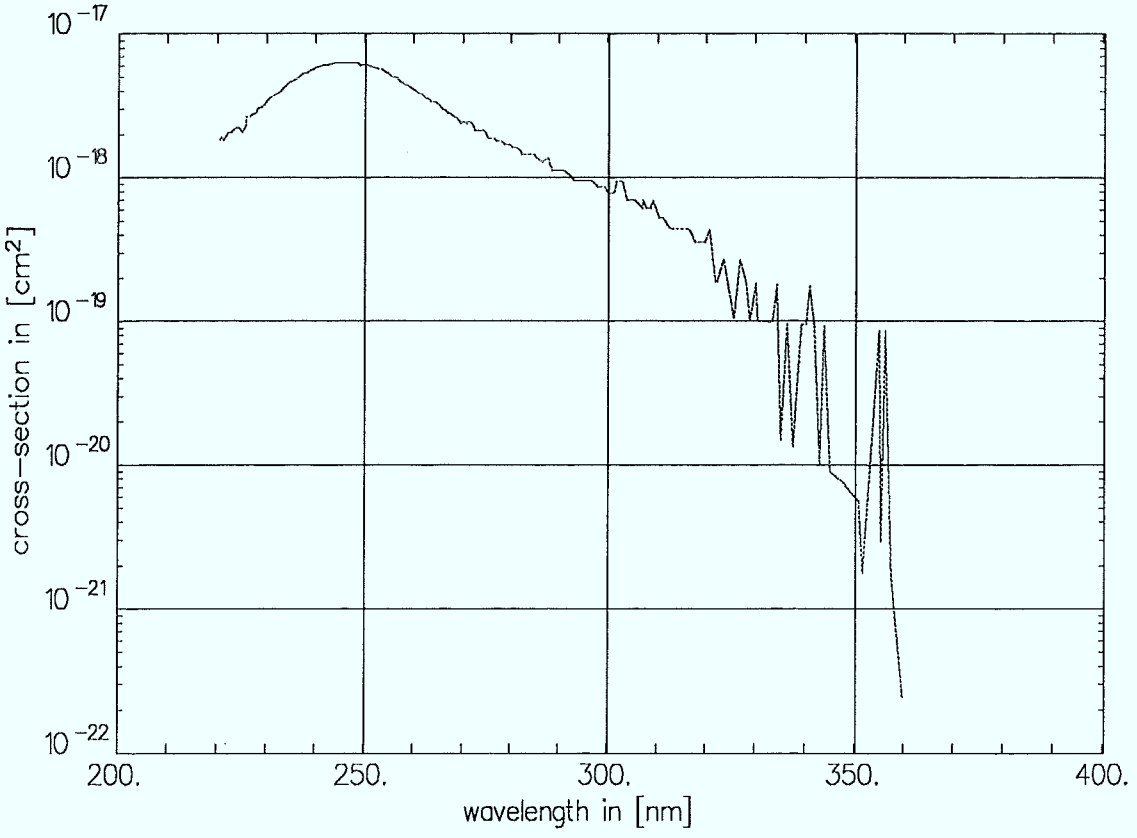
Reference:
Cox, R.A., and G.D. Hayman, The Stability and Photochemistry of Dimers of the ClO Radical and Implications for Antarctic Ozone Depletion, Nature, **332** (1988), 796-800

Data: diagram

Temperature: 265. K

Temperature dependence: no

Comment: The dimer was prepared by photolysis of $Cl_2/O_3$



Substance: $Cl_2O_2$

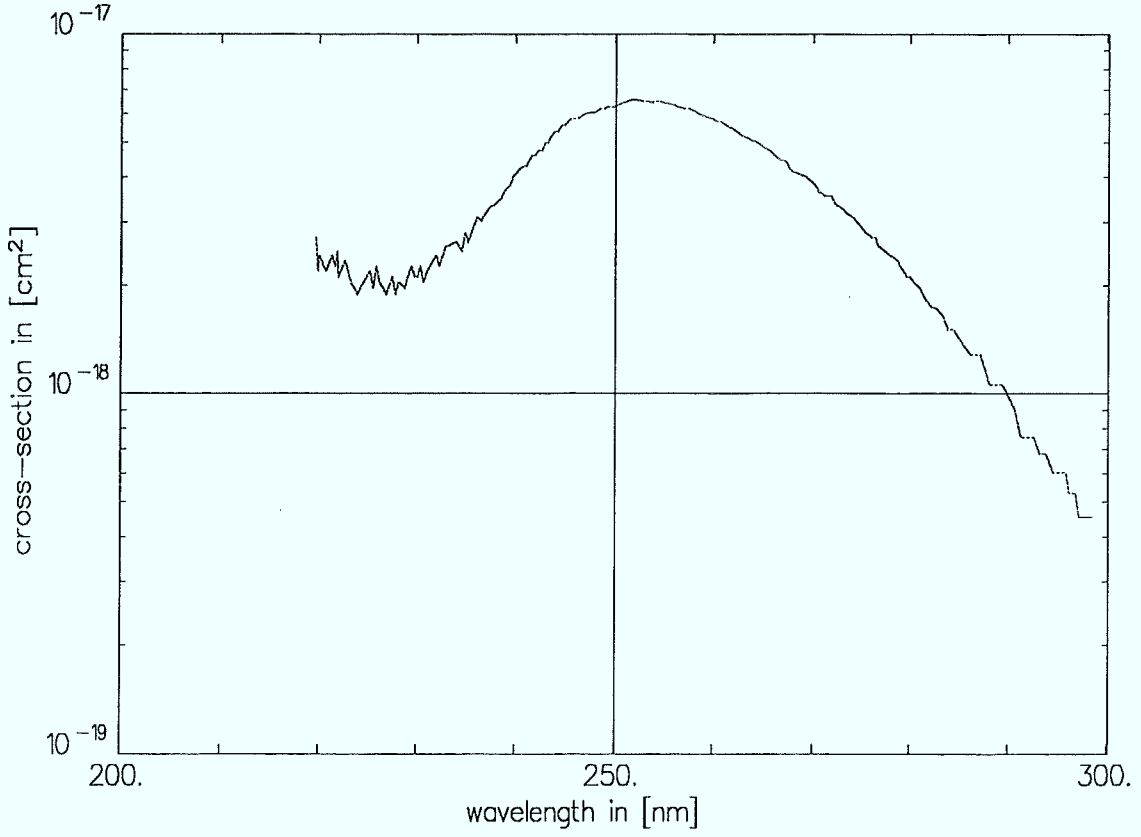
Reference:
Permien, T., R. Vogt, and R.N. Schindler, Absorption Spectra of HOCl and $Cl_2O_2$, Air Pollution Research Report, **17** (1988), 149-154

Data: diagram

Temperature: 235. K

Temperature dependence: no

Comment: The dimer was prepared by reacting Cl-atoms with $O_3$



Substance: $Cl_2O_2$

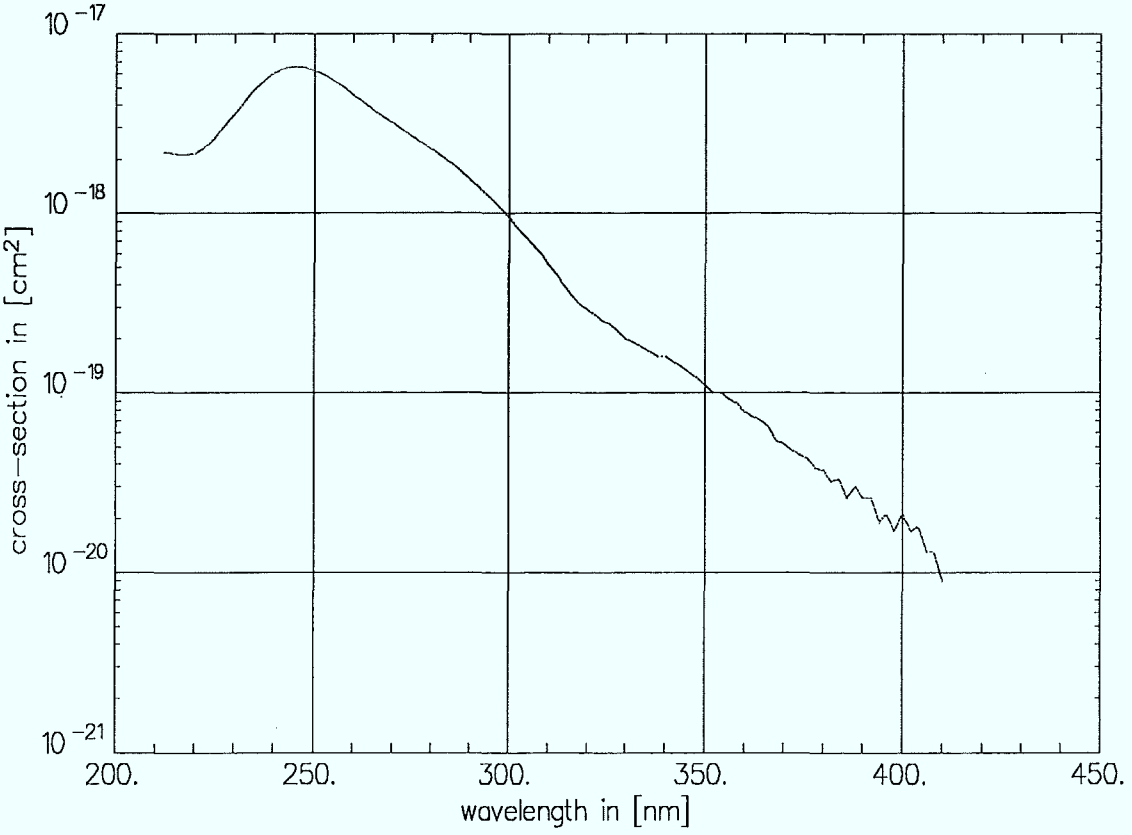
Reference:
Burkholder, J.B., J.J. Orlando, and C.J. Howard, Ultraviolet Absorption Cross Section of $Cl_2O_2$ between 210 and 410 nm, J. Phys. Chem., **94** (1990), 687-695

Data: table Resolution: 2.0 nm

Temperature: 250. K

Temperature dependence: no

Comment: $Cl_2O_2$ was formed from the three body association of two ClO radicals (ClO+ClO+M-> $Cl_2O_2$+M). ClO radicals were generated by reaction of Cl with an excess of $O_3$, OClO or $Cl_2O$.



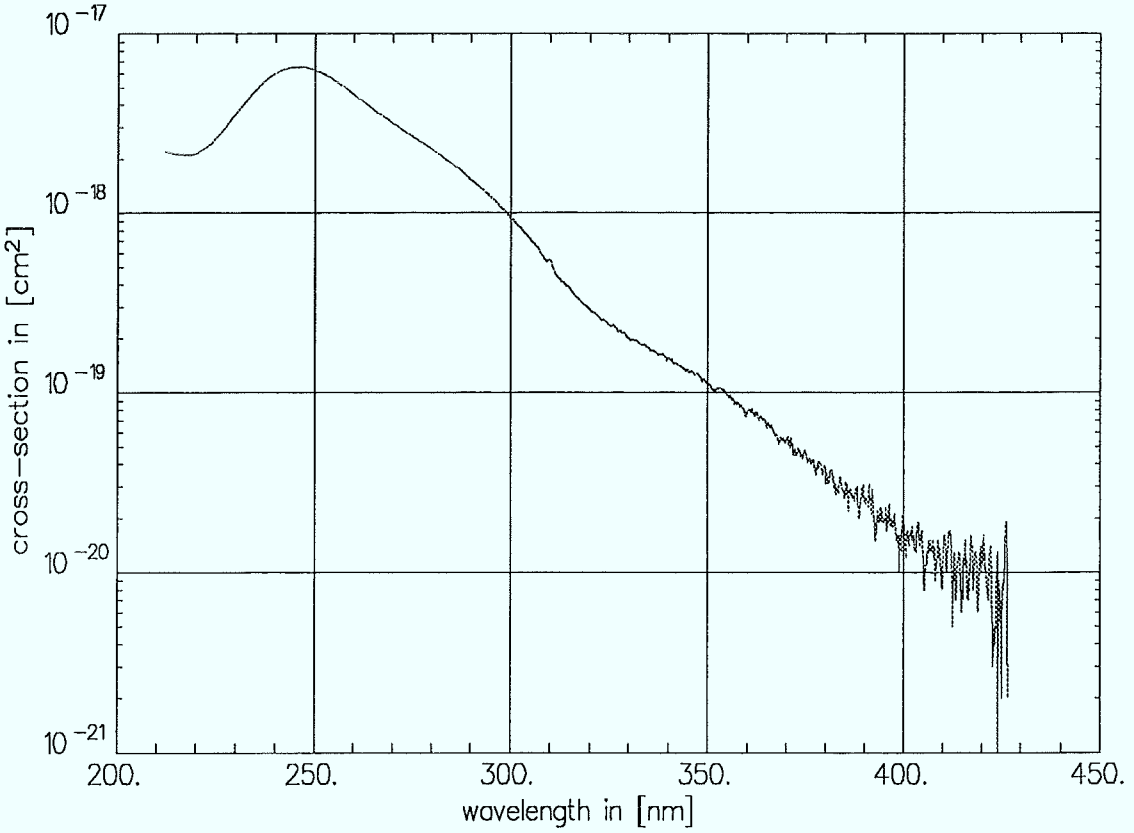
Substance: $Cl_2O_2$

Reference:
J.B. Burkholder, priv. comm., NOAA, 1988

Data: disk Resolution: 0.1 nm

Temperature: 250. K

Temperature dependence: no



Substance: $Cl_2O_2$

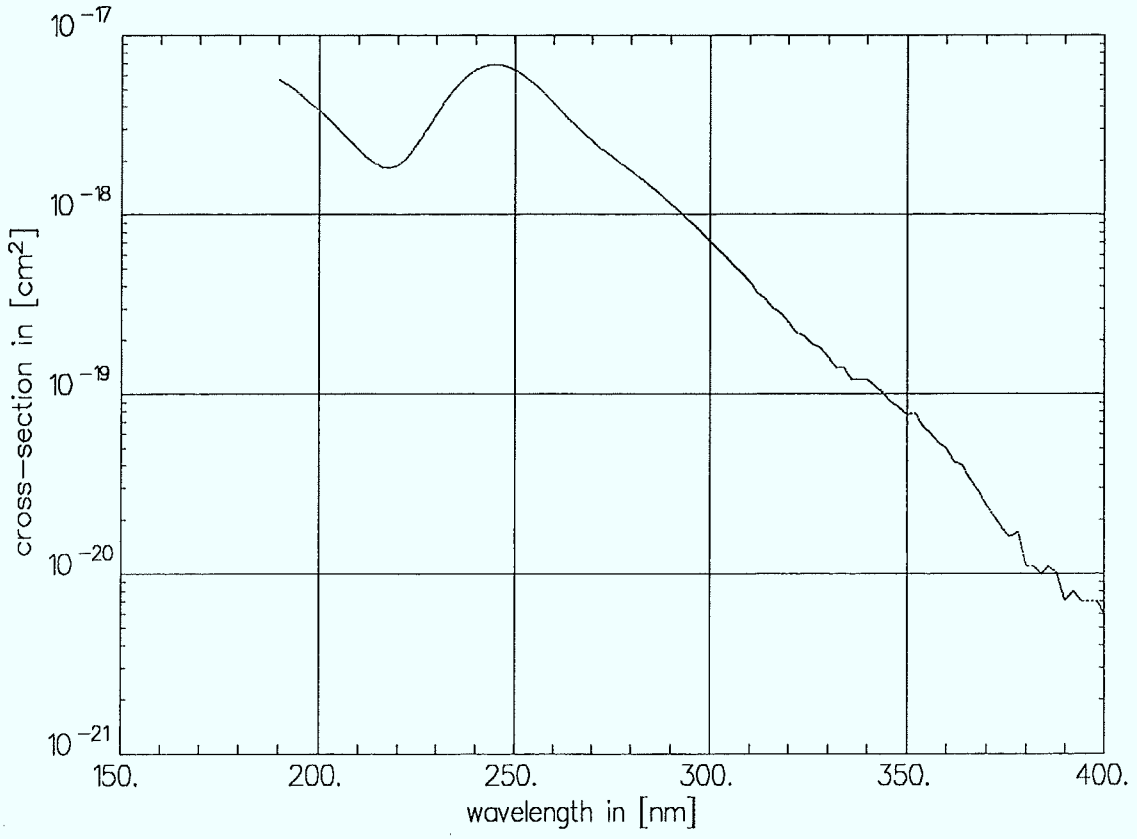
Reference:
DeMore, W.B., and E: Tschuikow-Roux, Ultraviolet Spectrum and Chemical Reactivity of the ClO Dimer, J. Phys. Chem., **94** (1990), 5856-5860

Data: table Resolution: 2.0 nm

Temperature: 206. K

Temperature dependence: no

Comment: The dimer was prepared by photolysis of $Cl_2/O_3$ or $Cl_2/Cl_2O$ mixtures



Substance: $Cl_2O_2$

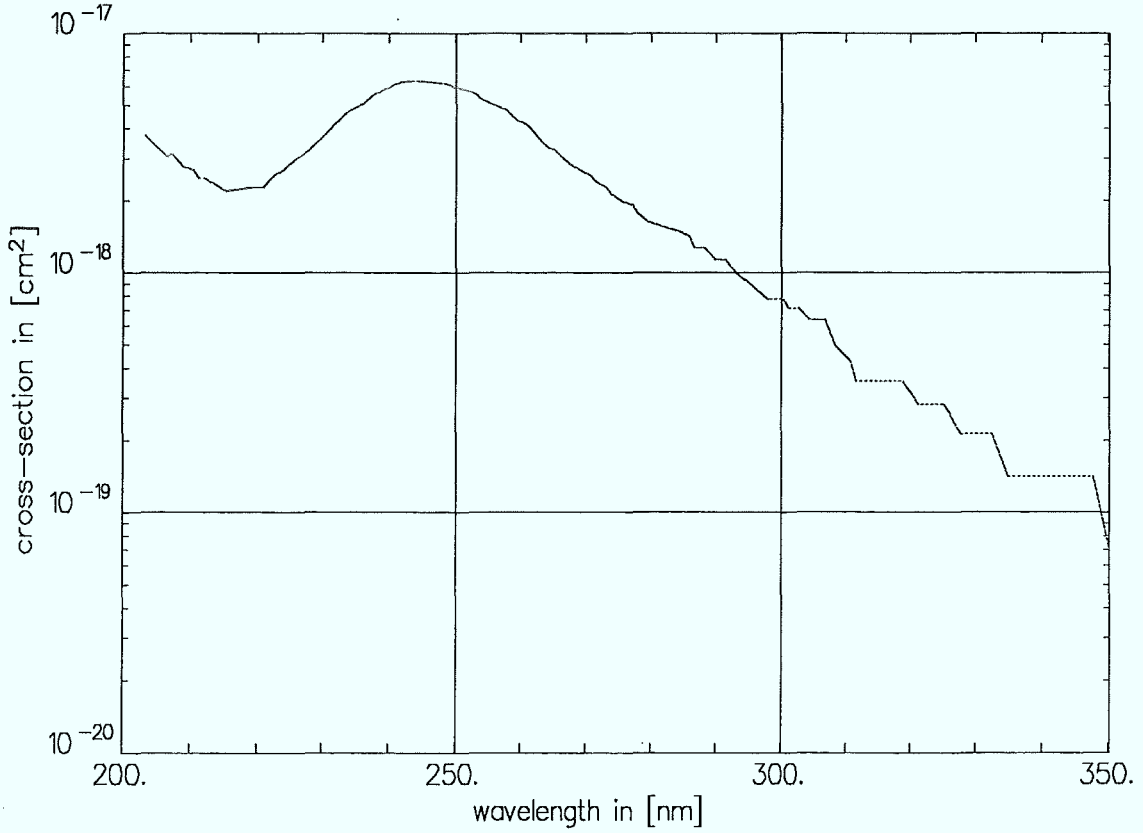
Reference:
Vogt, R., and R.N. Schindler, Photochemical Investigations on the Atmospheric Chlorine-Reservoir Compounds HOCl and $Cl_2O_2$, Air Pollution Research Report, **34** (1990), 167-172

Data: diagram

Temperature: 230. K

Temperature dependence: no

Comment: The dimer was prepared by reacting Cl-atoms with $O_3$. Contributions from residual $O_3$, ClO, $Cl_2$ and sometimes also some OClO are subtracted.



Substance: **$ClClO_2$**

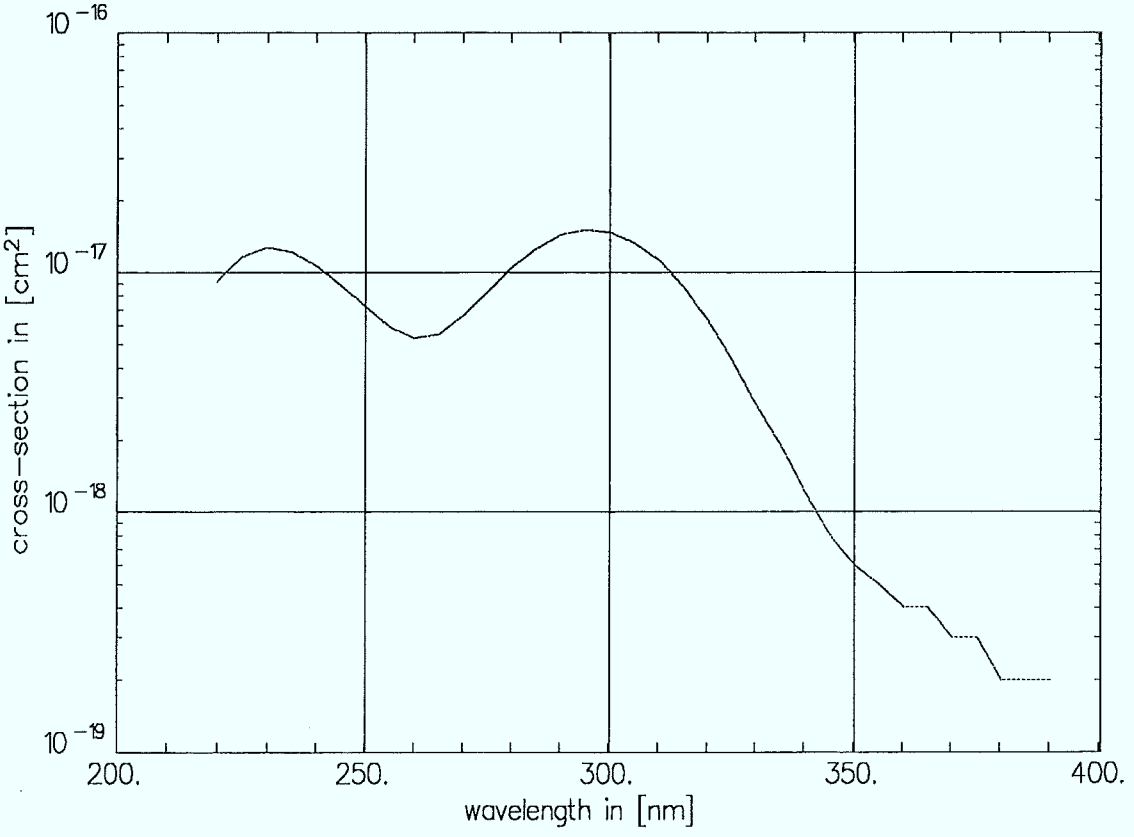
Reference:
Müller, H.S.P., and H. Willner, Gas Phase Studies on Chloryl Chloride, $ClClO_2$, Ber. Bunsenges., **96** (1992), 427-431

Data: table Resolution: 5.0 nm

Temperature: 298 K

Temperature dependence: no

Comment: $ClClO_2$ was generated by the reaction of $FClO_2$ with $BCl_3$ or HCl in the gas phase. $FClO_2$ was prepared from $ClO_2/F_2$ mixtures.



Substance: $Cl_2O_3$

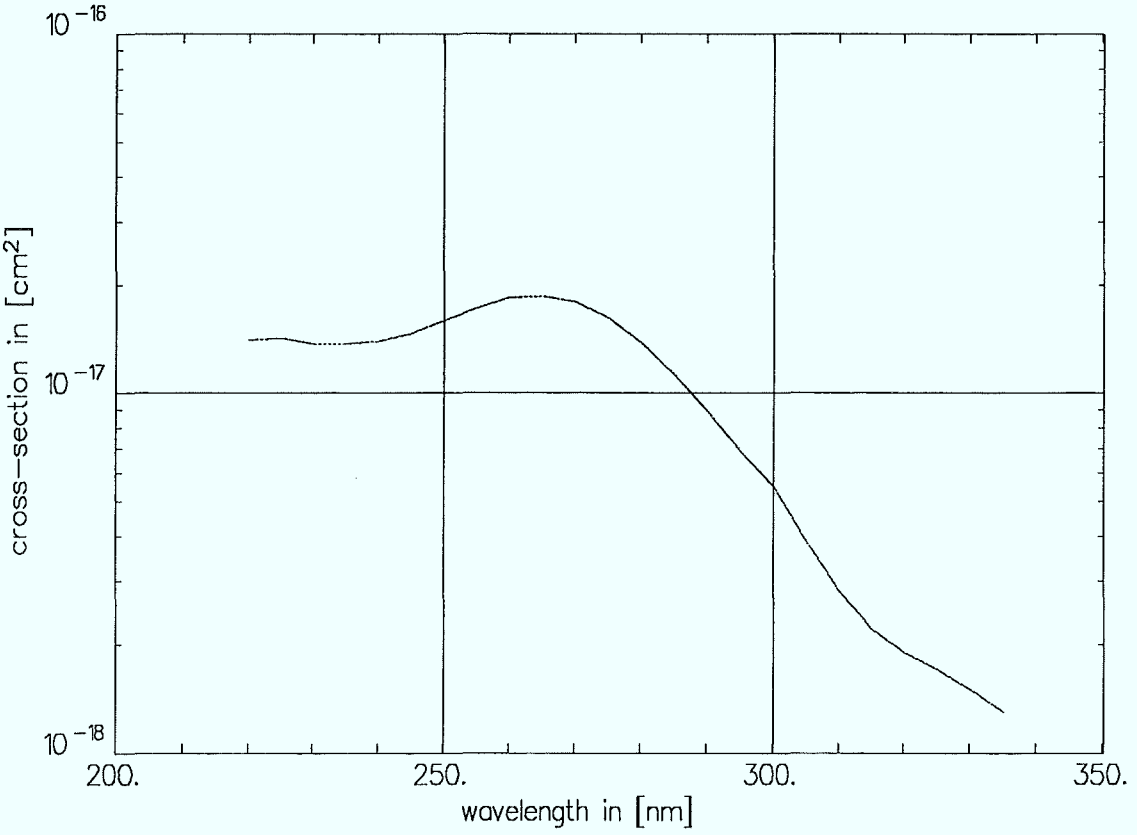
Reference:
Hayman, G.D., and R.A. Cox, UV Absorption Spectrum and Thermochemistry of $Cl_2O_3$ Formed in the Photolysis of OClO-Containing Mixtures at Low Temperatures, Chem. Phys. Lett., **155** (1989), 1-7

Data: table Resolution: 5.0 nm

Temperature: 233. K

Temperature dependence: no

Comment: Three systems ($OClO/N_2$, $OClO/O_2/N_2$, $OClO/Cl_2O/N_2$) were chosen for study $Cl_2O_3$



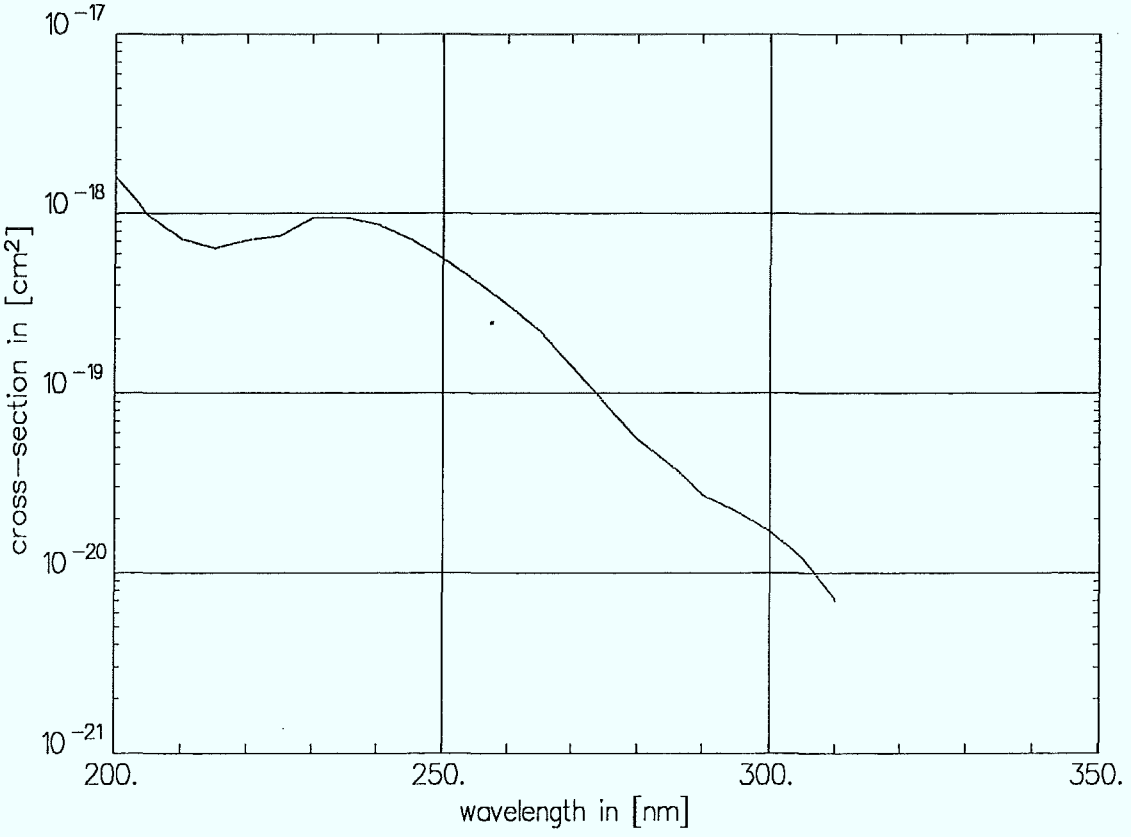
Substance: $ClOClO_3$

Reference:
López, M.I., and J.E. Sicre, Ultraviolet Spectrum of Chlorine Perchlorate, J. Phys. Chem., **92** (1988), 563-564

Data: table Resolution: 5.0 nm

Temperature: 293 K

Temperature dependence: no



Substance: $Cl_2O_6$

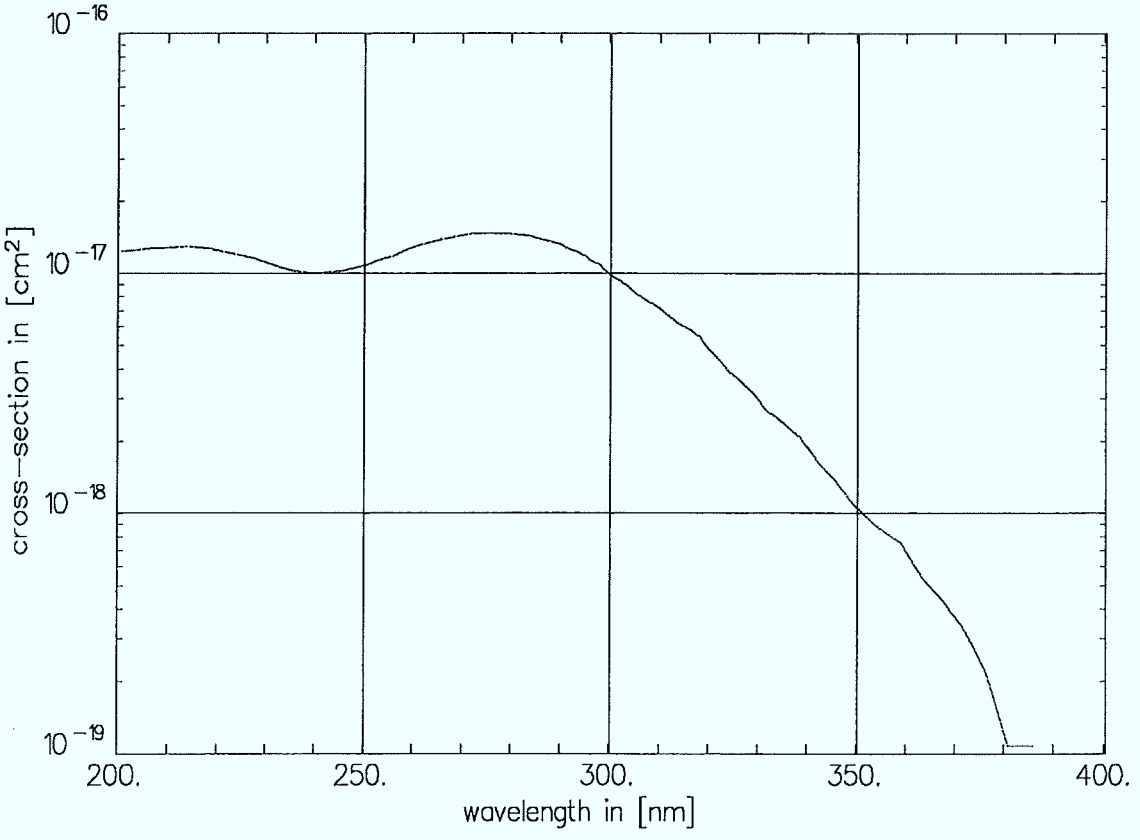
Reference:
López, M.I., and J.E. Sicre, Physicochemical Properties of Chlortine Oxides. 1. Composition, Ultraviolet Spectrum, and Kinetics of the Thermolysis of Gaseous Dichlorine Hexoxide, J. Phys. Chem., **94** (1990), 3860-3863

Data: diagram

Temperature: 293 K

Temperature dependence: no

Comment: $Cl_2O_6$ was formed by three body recombination of $ClO_3$. $ClO_3$ was formed by reaction of ClOO in an excess of $O_3$.



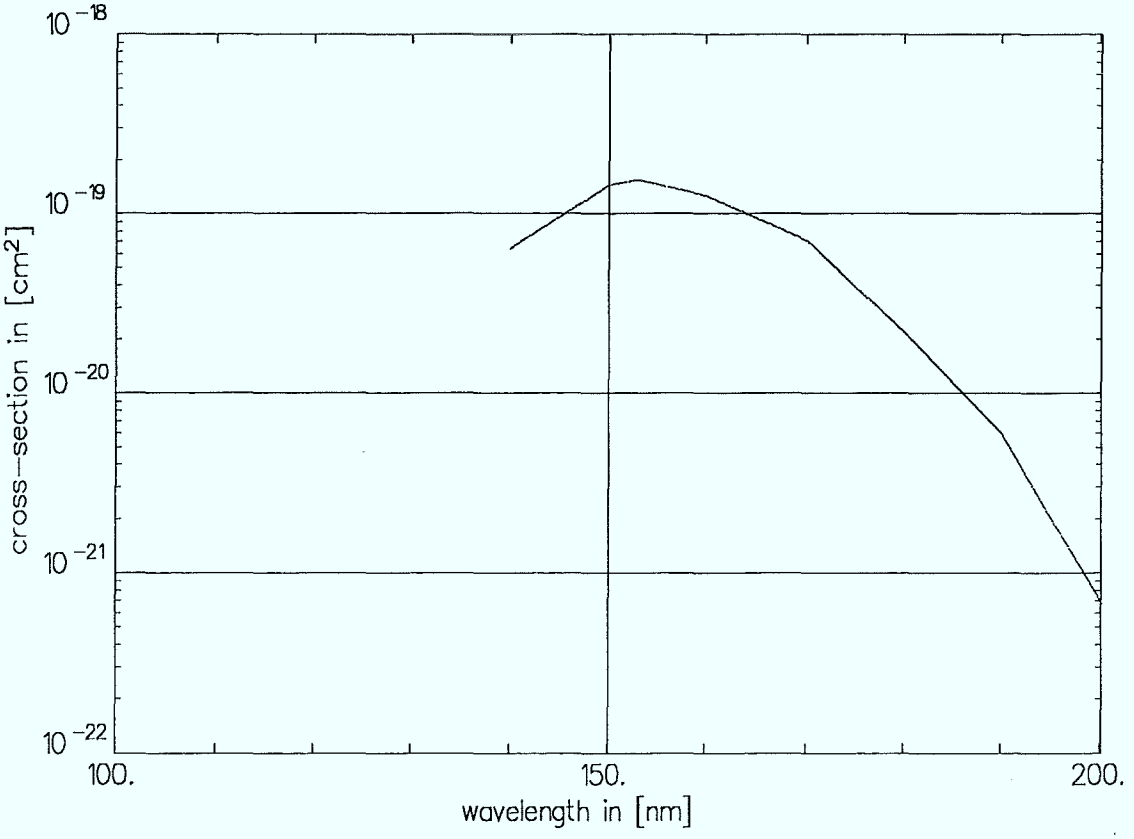
Substance: **HCl**

Reference:
Romand, J., and B. Vidar, Spectre d'absorption de l'acide chlorhydrique gazeux dans la région de Schumann, Comptes rendus., **228** (1948), 238-240

Data: table Resolution: 3.0 - 10.0 nm

Temperature: 298. K

Temperature dependence: no



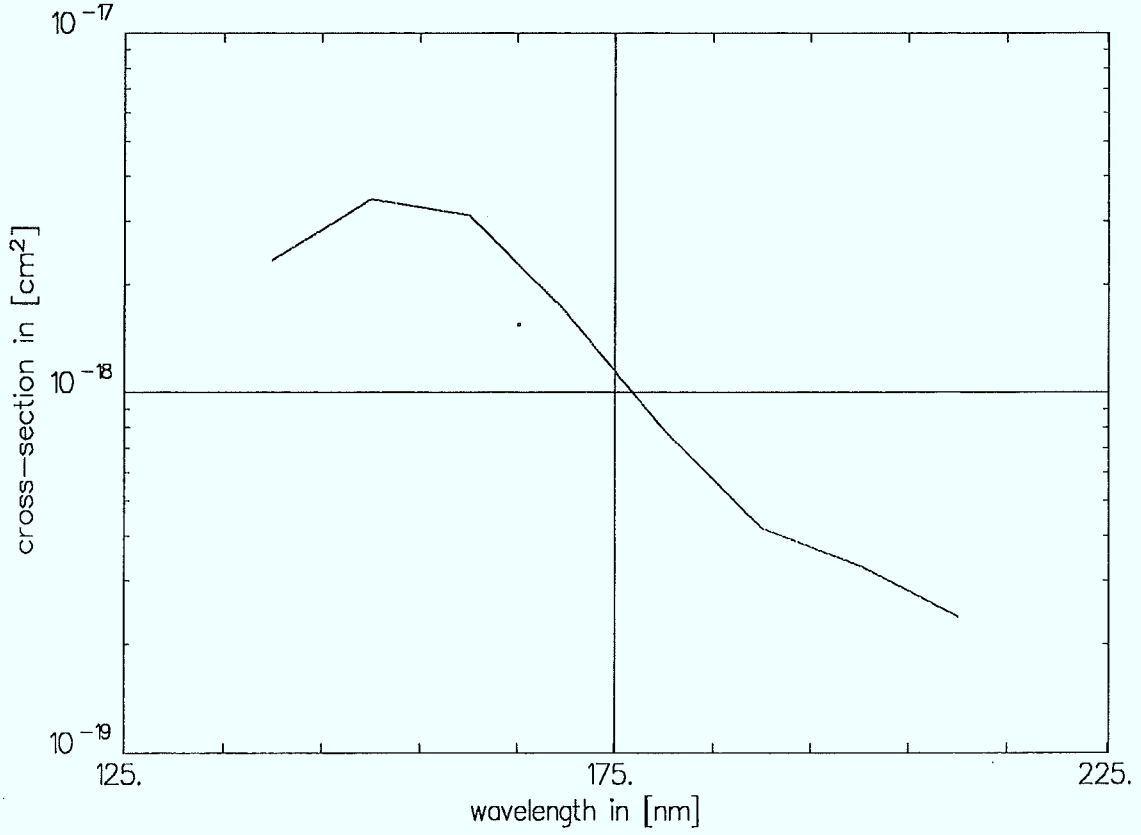
Substance: **HCl**

Reference:
Myer, J.A., and J.A.R. Samson, Vacuum-Ultraviolet Absorption Cross Sections of CO, HCl, and ICN between 1050 and 2100 A, J. Chem. Phys. **52** (1970), 266-271

Data: diagram

Temperature: 298. K

Temperature dependence: no



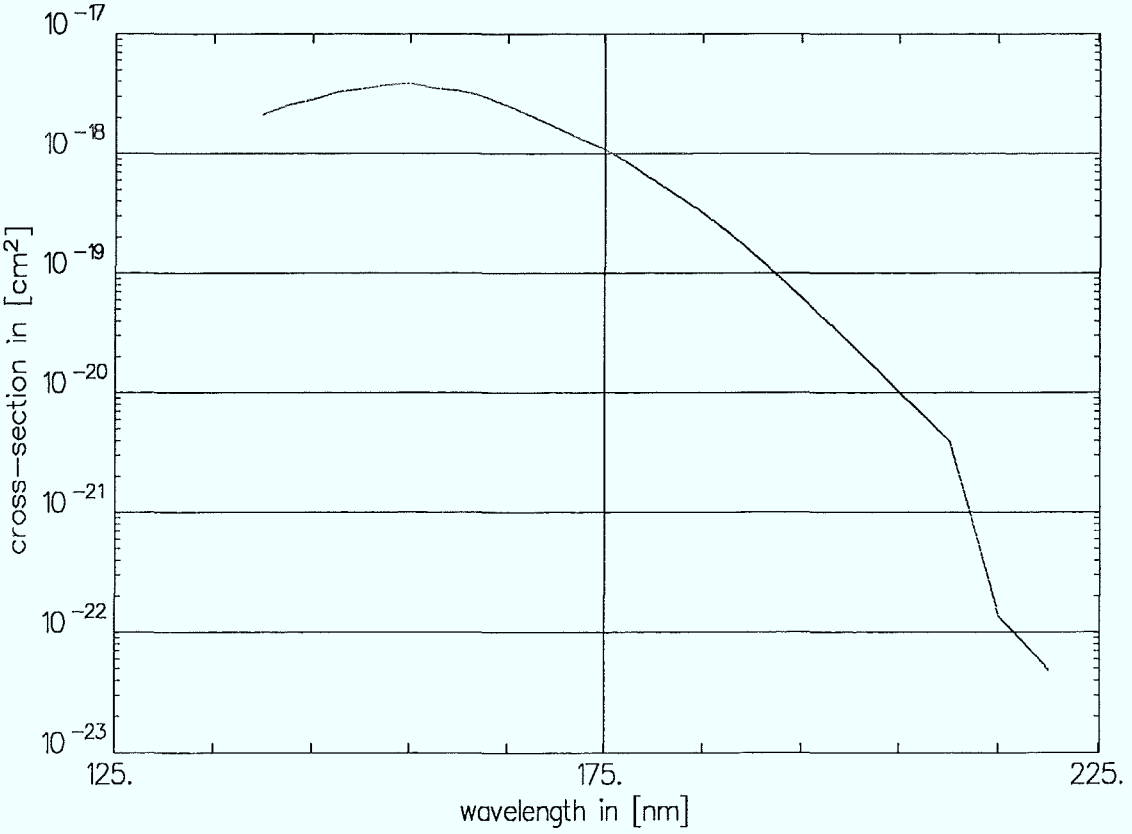
Substance: **HCl**

Reference:
Inn, E.C.Y., Absorption Coefficient of HCl in the Region 1400 to 2200 A, J. Atmos. Sci., **32** (1975), 2375-2377

Data: table Resolution: 2.5 nm

Temperature: 298. K

Temperature dependence: no



Substance: **HOCl**

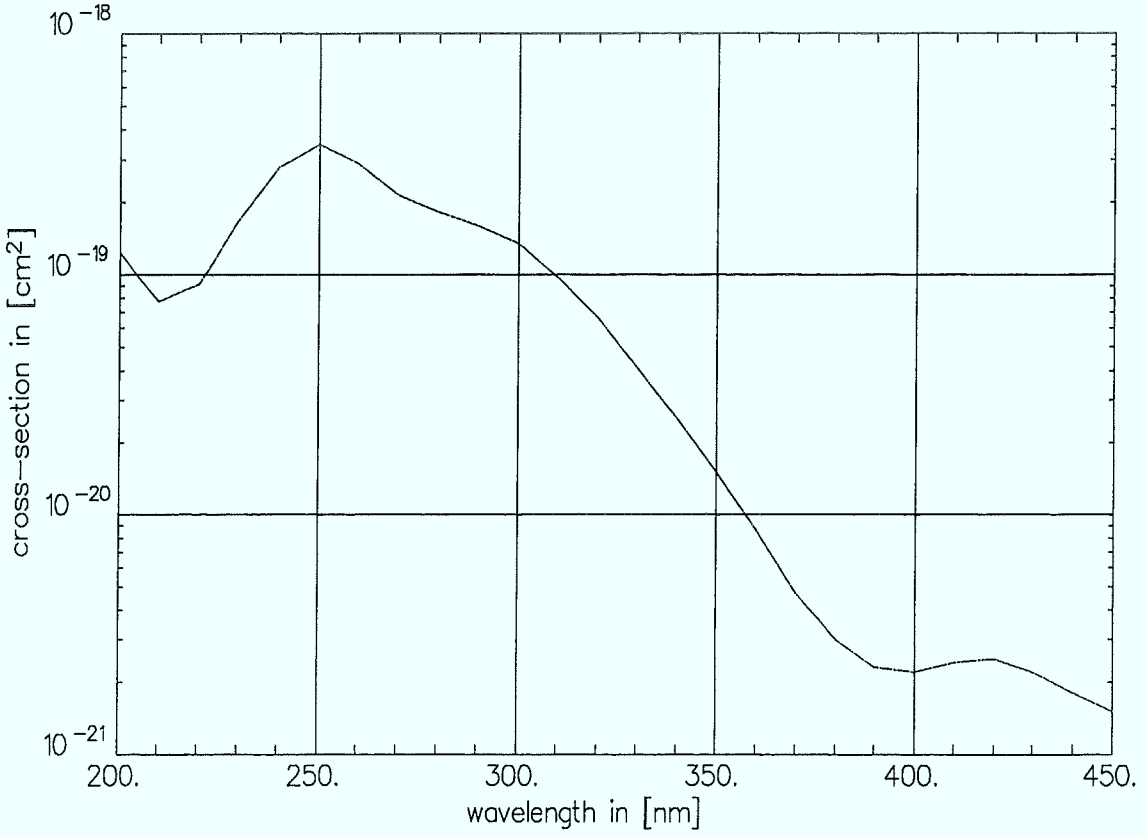
Reference:
Molina, L.T., and M.J. Molina, Ultraviolet Spectrum of HOCl, J. Phys. Chem., **82** (1978), 2410-2414

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: Equilibrium mixture of $H_2O/Cl_2O/HOCl$ was used to produce HOCl.



Substance: **HOCl**

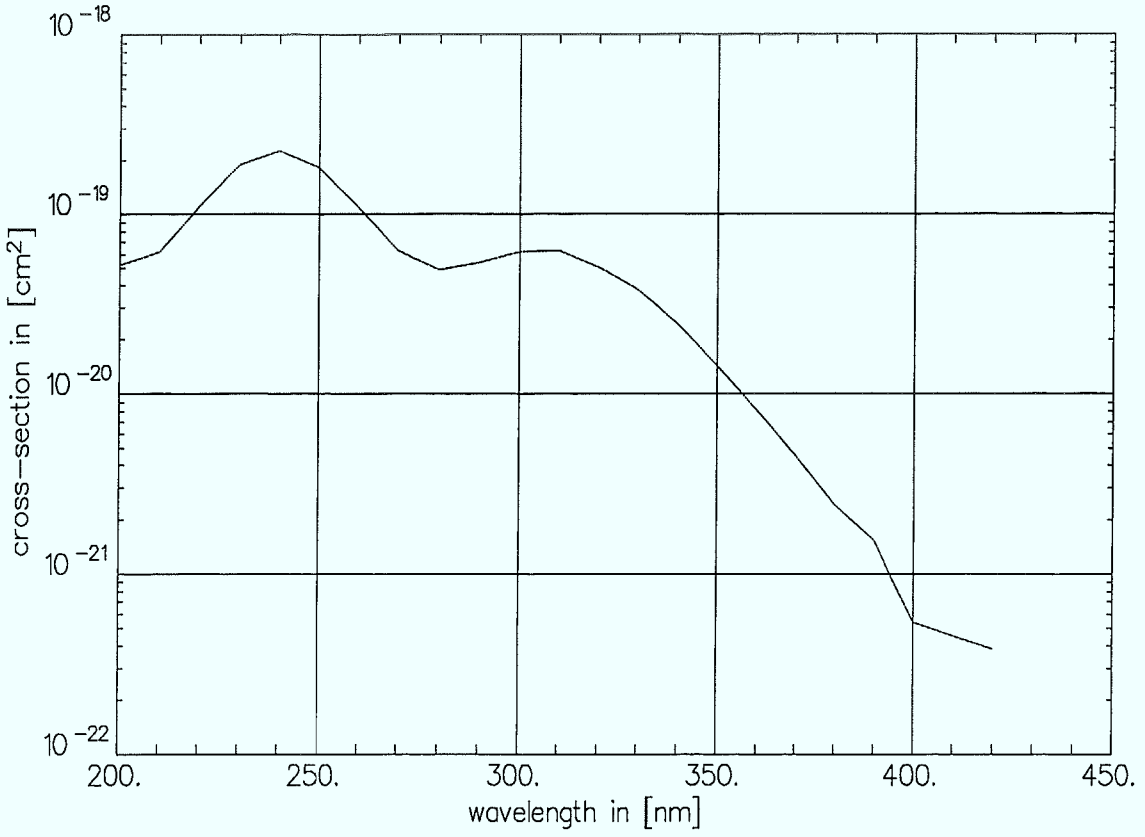
Reference:
Knauth, H.-D., H. Alberti, and H. Clausen, Equilibrium Constant of the Gas Reaction $Cl_2O + H_2O = 2HOCl$ and the Ultraviolet Spectrum of HOCl, J. Phys. Chem., **83** (1979), 1604-1612

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 333. K

Temperature dependence: no

Comment: Equilibrium mixture of $H_2O/Cl_2O/HOCl$ was used to produce HOCl.



Substance: **HOCl**

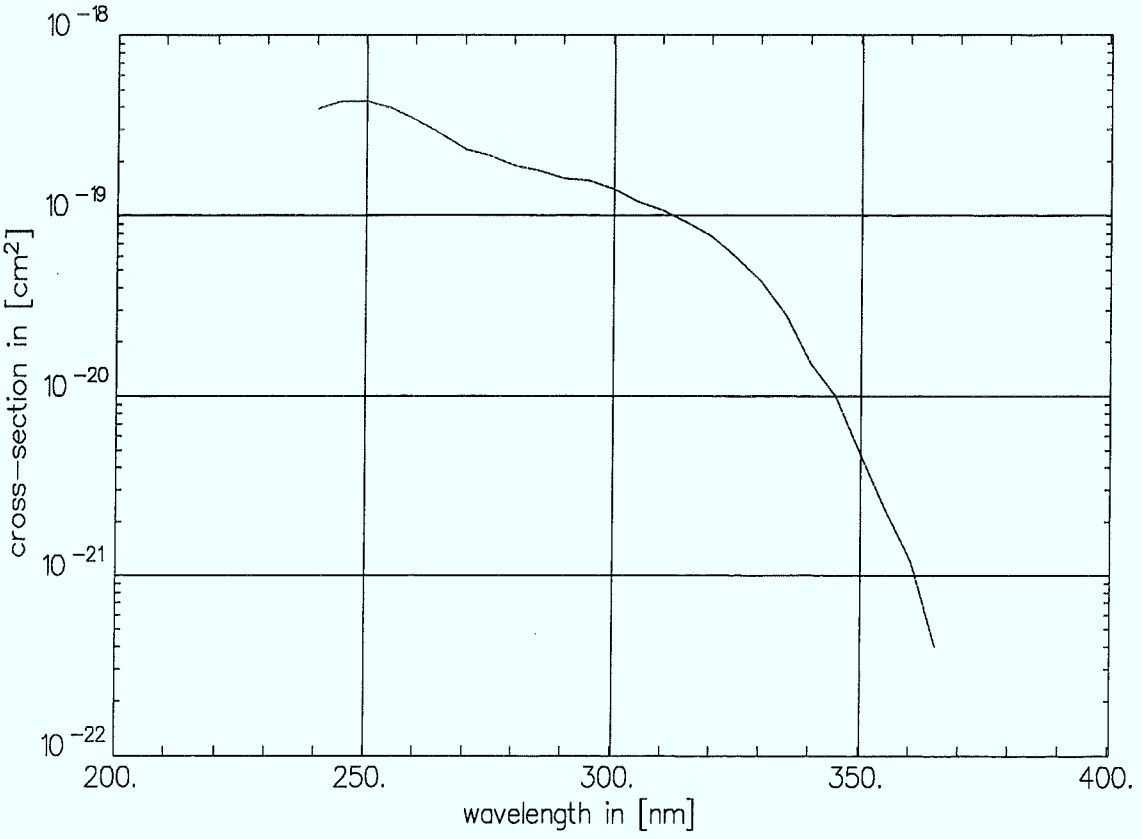
Reference:
Mishalanie, E.A., C.J. Rutkowski, R.S. Hutte, and J.W. Birks, Ultraviolet Absorption Spectrum of Gaseous HOCl, J. Phys. Chem., **90** (1986), 5578-5584

Data: table Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: A dynamic source was used to generate HOCl.



Substance: **HOCl**

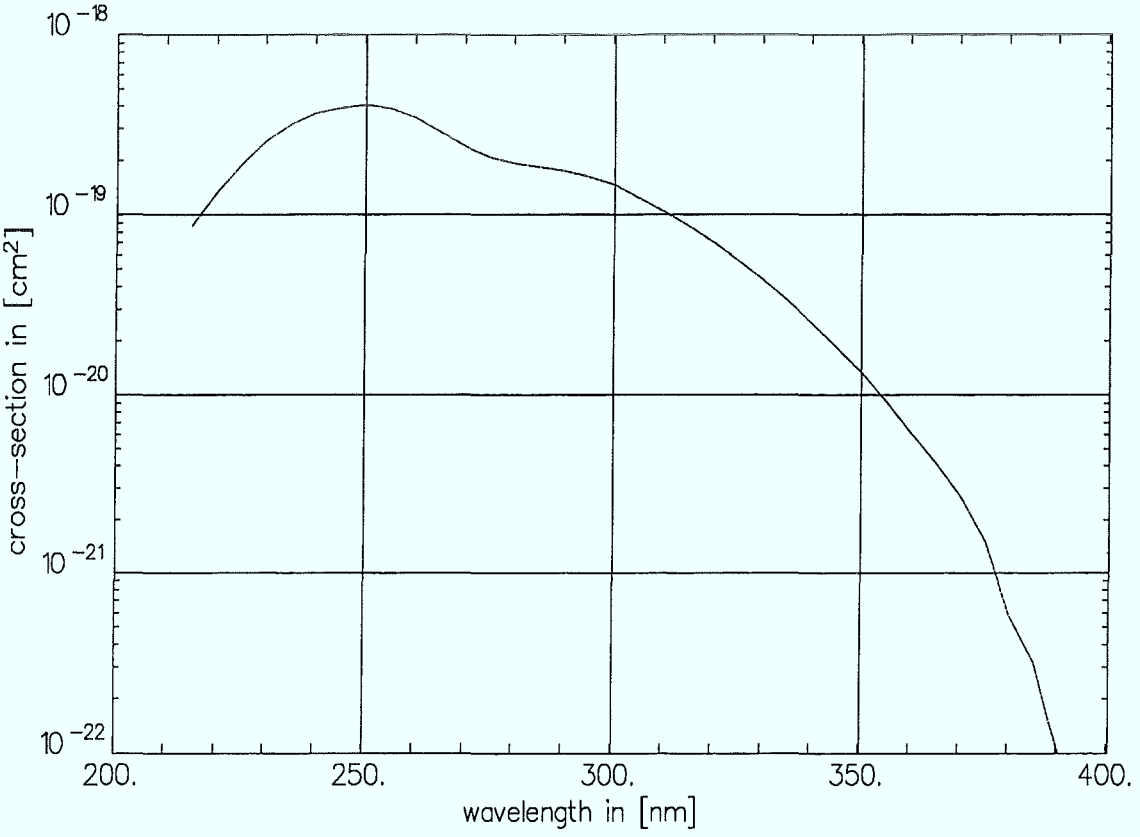
Reference:
Permien, T., R. Vogt, and R.N. Schindler, Absorption Spectra of HOCl and $Cl_2O_2$, Air Pollution Research Report, **17** (1988), 149-154

Data: disk Resolution: 5.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: A dynamic source was used to generate HOCl.



Substance: **HOCl**

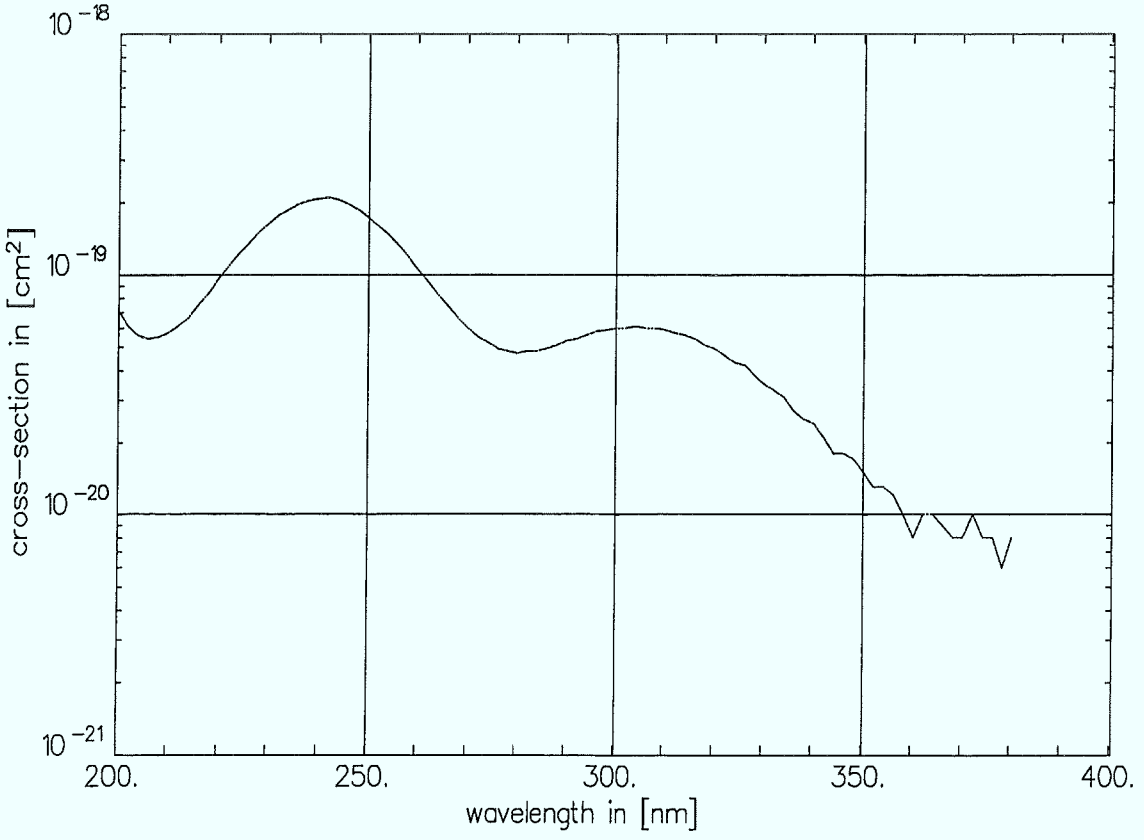
Reference:
Burkholder, J.B., Ultraviolet Absorption Spectrum of HOCl, J. Geophys. Res., **98** (1993), 2963-2974

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: Equilibrium mixture of $H_2O/Cl_2O/HOCl$ was used to produce HOCl.



Substance: **HOCl**

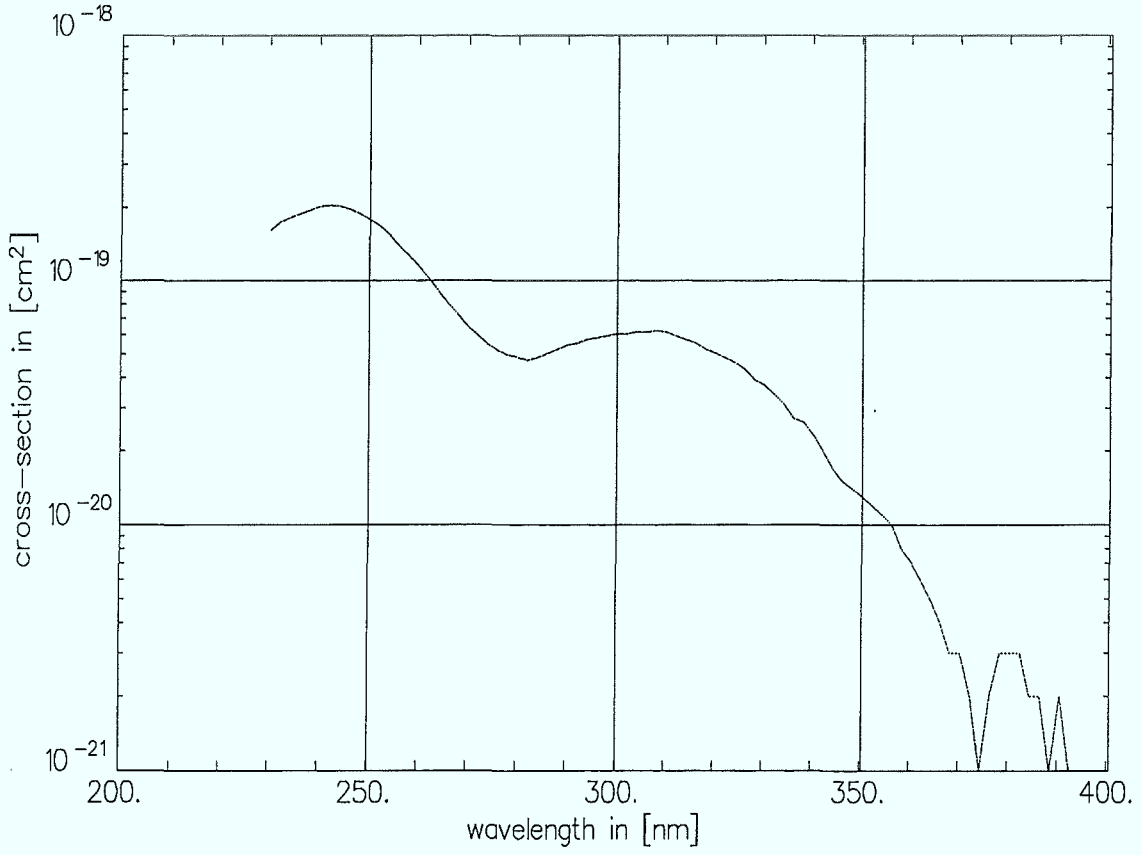
Reference:
Jungkamp, T.P.W., U. Kirchner, M. Schmidt, and R.N. Schindler, UV Absorption Cross-Section Data for the Hypochlorites ROCl (R=H, $CH_3$, $C_2H_5$, i-$C_3H_7$, tert-$C_4H_9$), J. Photochem. Photobiol., **91** (1995), 1-6

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: A dynamic source was used to generate HOCl.



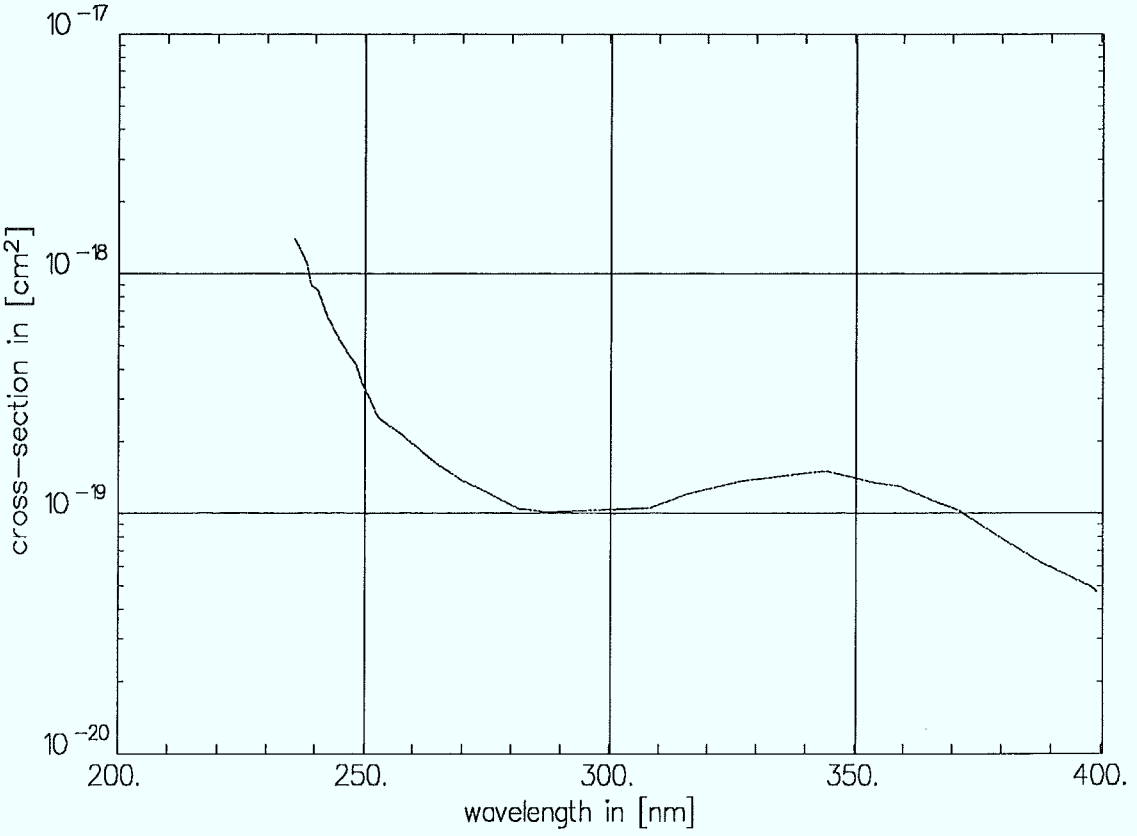
Substance: **ClNO**

Reference:
Martin, H., and R. Gareis, Die Kinetik der Reaktion von $ClO_2$ mit $NO_2$ in der Lösungsphase, Z. Elektrochem., **60** (1956), 959-964

Data: diagram

Temperature: 298. K

Temperature dependence: no



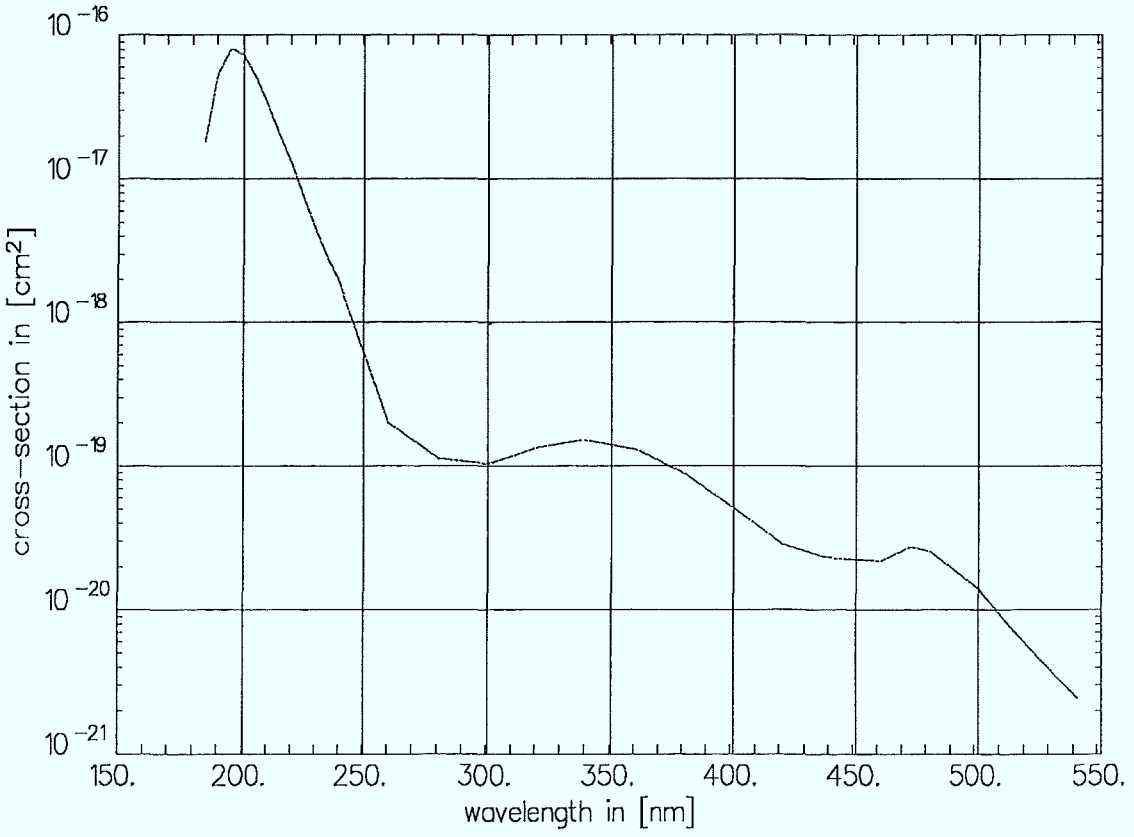
Substance: **ClNO**

Reference:
Ballash, N.M., and D.A. Armstrong, On the Ultraviolet and Visible Absorption Spectrum of ClNO, Spectrochim. Acta, **30A** (1974), 941-944.

Data: table Resolution: 5.0 - 20.0 nm

Temperature: 298 K

Temperature dependence: no



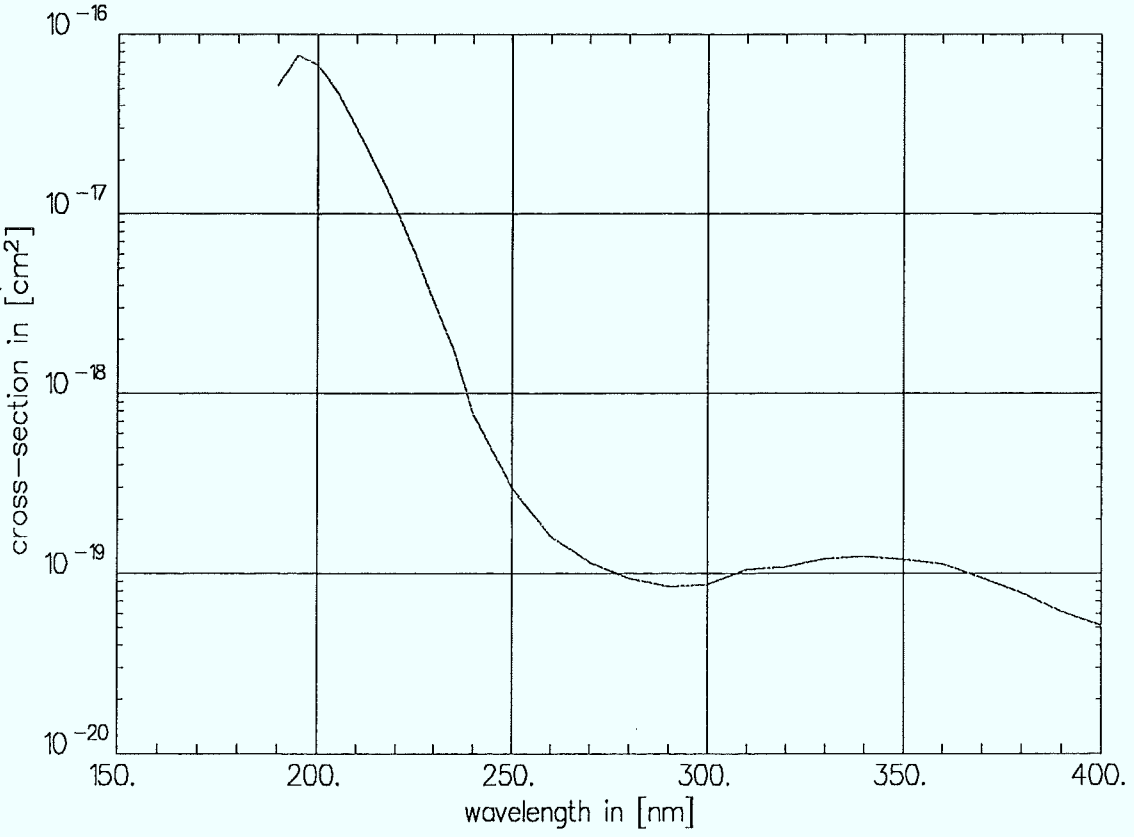
Substance: **ClNO**

Reference:
Illies, A.J., and G.A. Takacs, Gas Phase Ultra-Violet Photoabsorption Cross-Sections for Nitrosyl Chloride and Nitrylchloride, J. Photochem., **6** (1976/77), 35-42

Data: table Resolution: 2.5 - 10.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **ClNO**

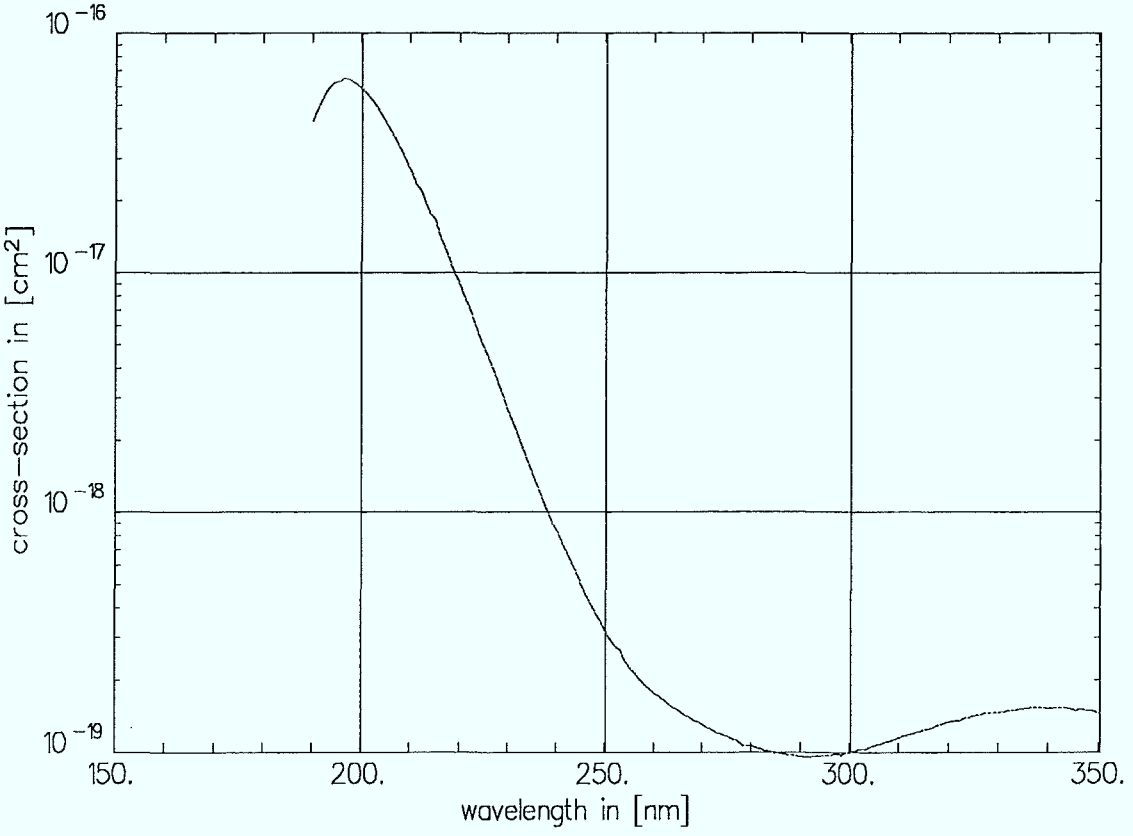
Reference:
Tyndall, G.S., K.M. Stedman, W. Schneider, J.P. Burrows, and G.K. Moortgat, The Absorption Spectrum of ClNO between 190 and 350 nm, J. Photochem., **36** (1987), 133-139

Data: table Resolution: 1.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: ClNO was prepared by mixing $Cl_2$ with NO and allowing the gases to stand for several days.



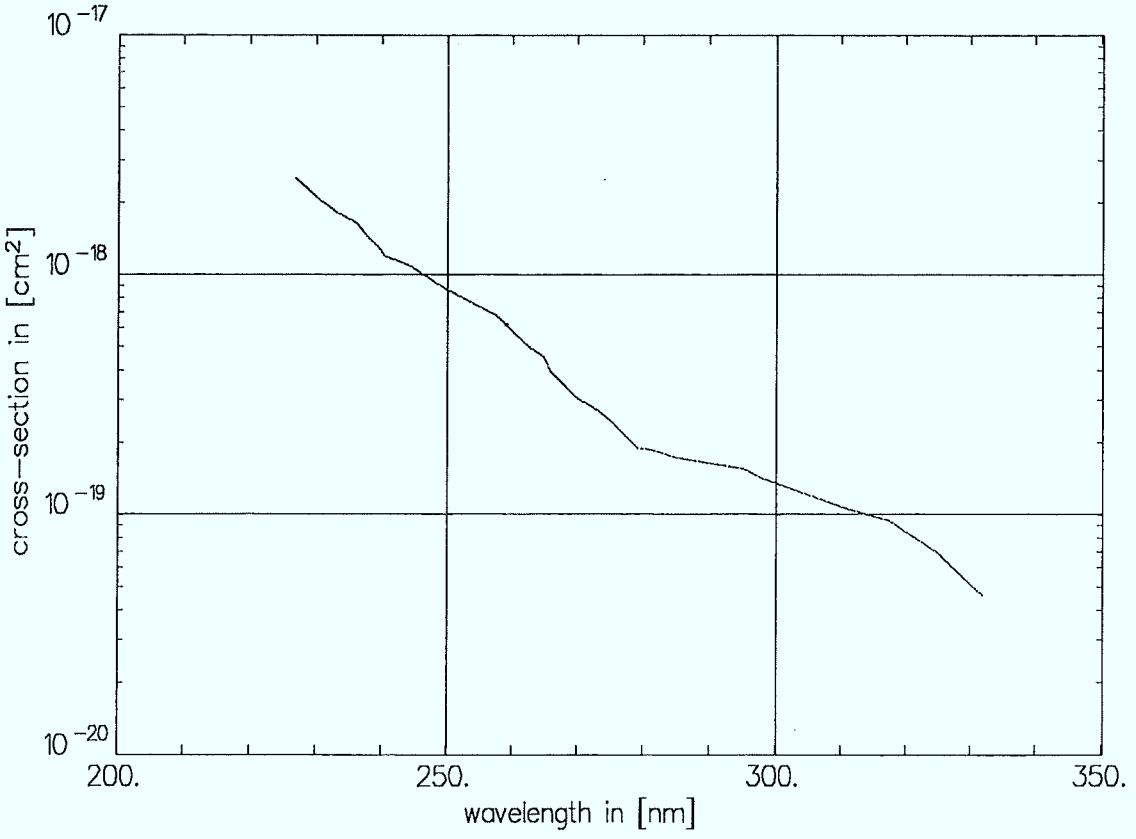
Substance: $ClNO_2$

Reference:
Martin, H., and R. Gareis, Die Kinetik der Reaktion von $ClO_2$ mit $NO_2$ in der Lösungsphase, Z. Elektrochem., **60** (1956), 959-964

Data: diagram

Temperature: 298. K

Temperature dependence: no



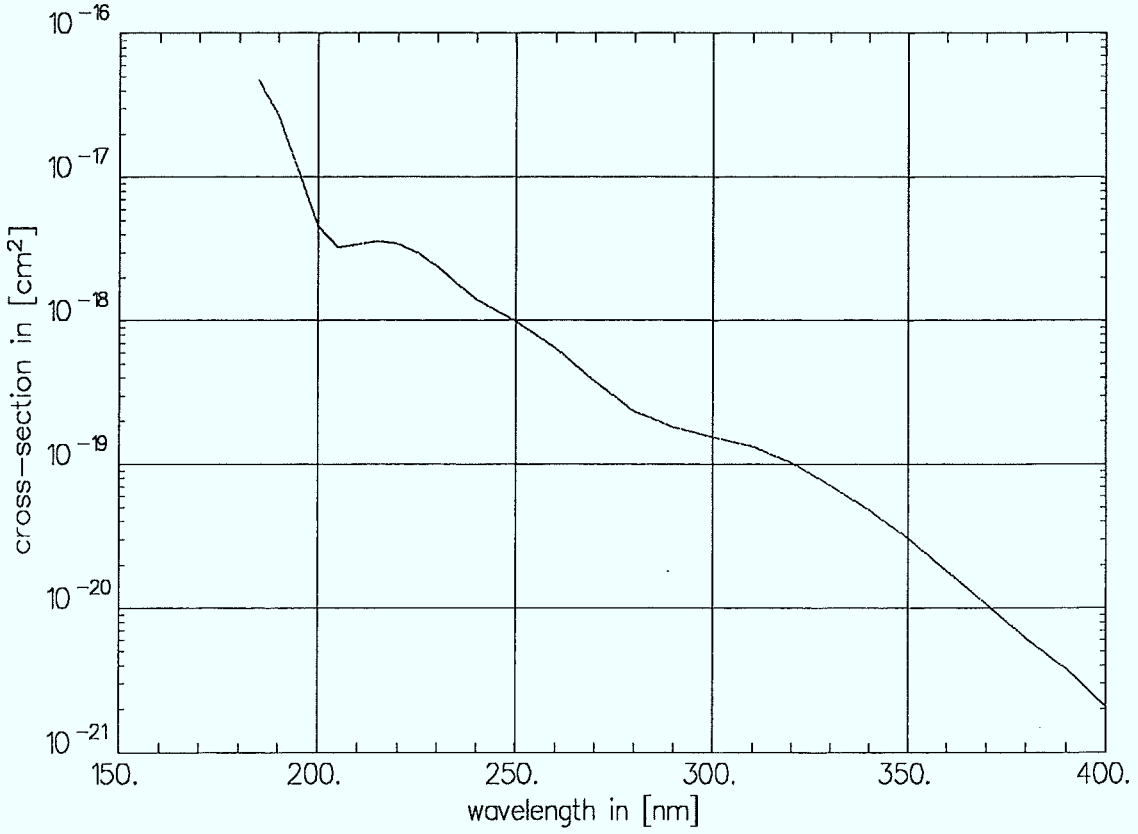
Substance: $ClNO_2$

Reference:
Illies, A.J., and G.A. Takacs, Gas Phase Ultra-Violet Photoabsorption Cross-Sections for Nitrosyl Chloride and Nitrylchloride, J. Photochem., **6** (1976/77), 35-42

Data: table Resolution: 2.5 - 10.0 nm

Temperature: 298. K

Temperature dependence: no



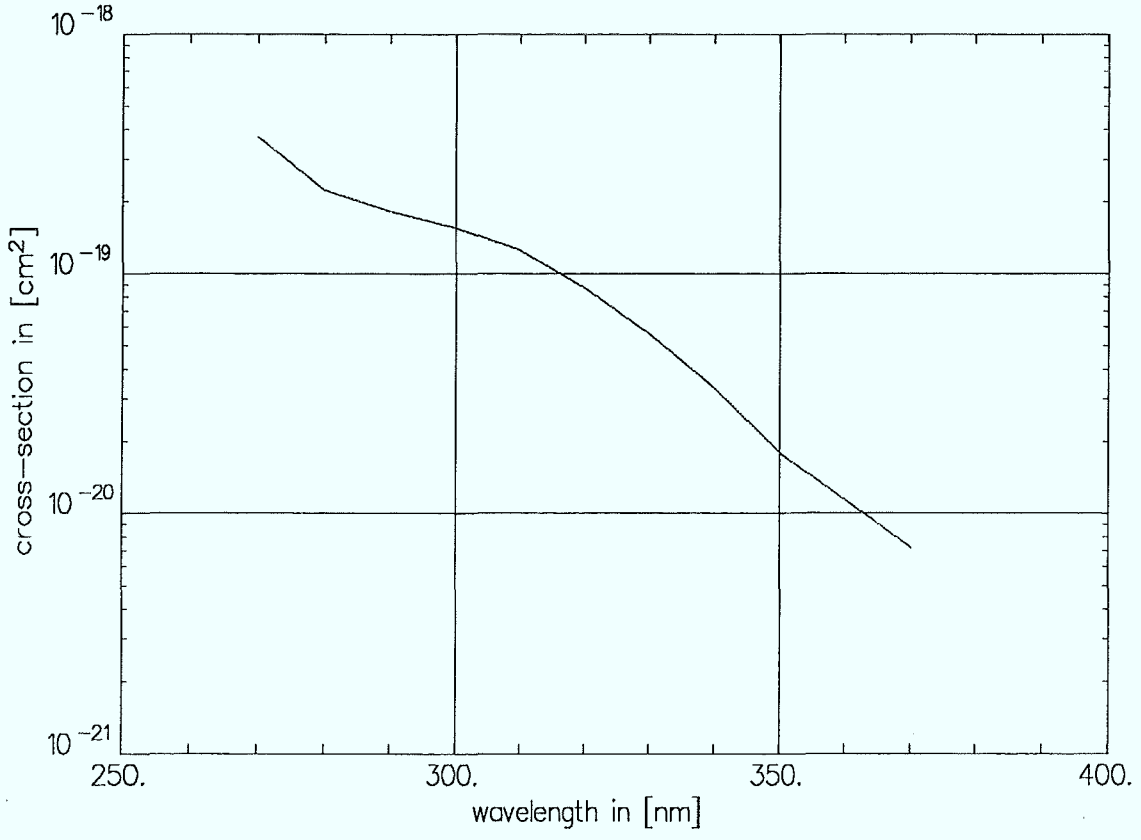
Substance: $ClNO_2$

Reference:
Nelson, H.H., and H.S. Johnston, Kinetics of the Reaction of Cl with ClNO and $ClNO_2$ and the Photochemistry of $ClNO_2$, J. Phys. Chem., **85** (1981), 3891-3896

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



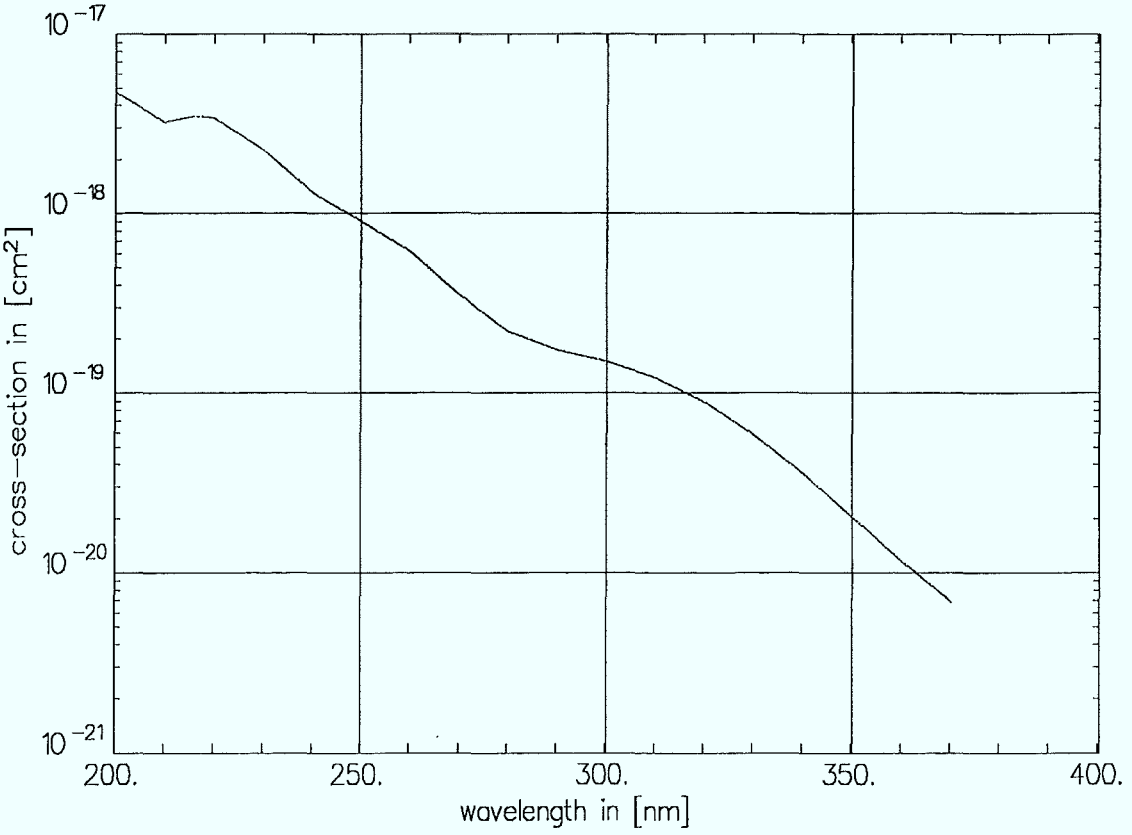
Substance: $ClNO_2$

Reference:
Ganske, J.A., H.N. Berko, and B.J. Finlayson-Pitts, Absorption Cross Sections for Gaseous $ClNO_2$ and $Cl_2$ at 298 K: Potential Organic Oxidant Source in the Marine Troposphere, J. Geophys. Res., **97** (1992), 7651-7656

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **ClONO**

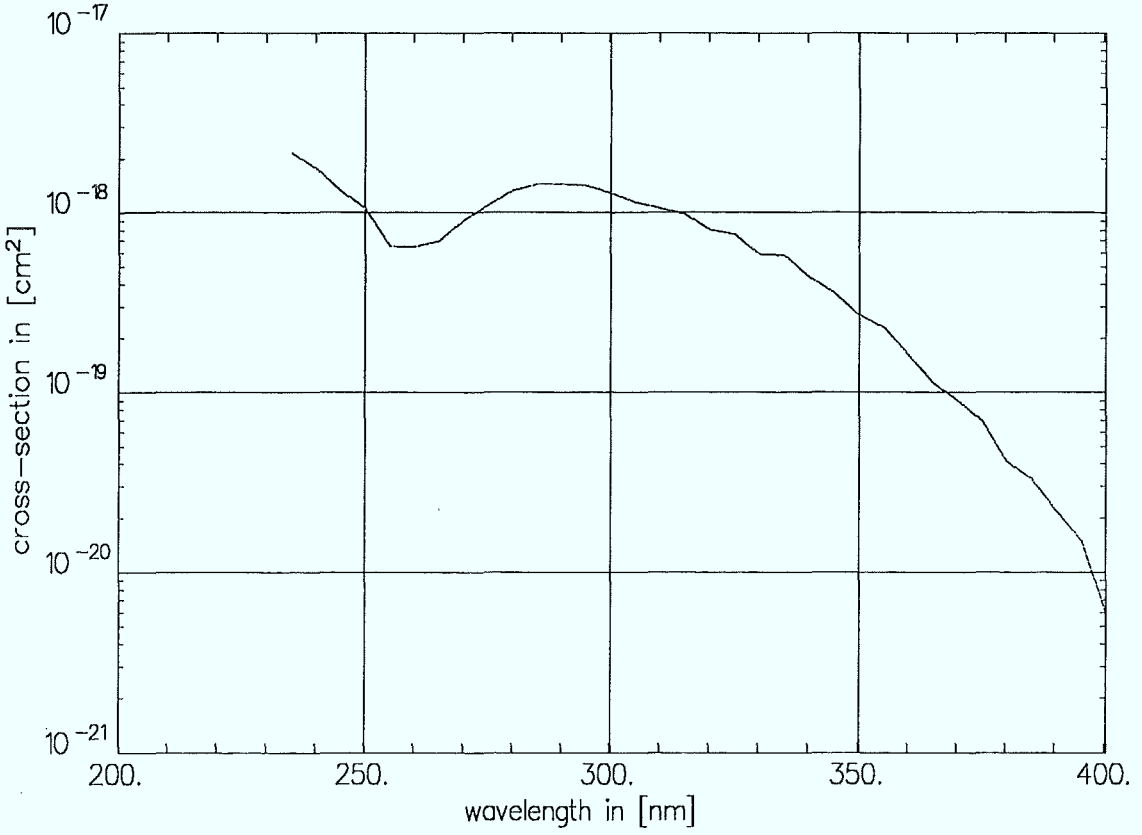
Reference:
Molina, L.T., and M.J. Molina, Ultraviolet Absorption Spectrum of Chlorine Nitrite, ClONO, Geophys. Res. Lett. 4 (1977), 83-86

Data: table Resolution: 5.0 nm

Temperature: 231. K

Temperature dependence: no

Comment: ClONO was prepared from a mixture of $Cl_2O$ and ClNO.



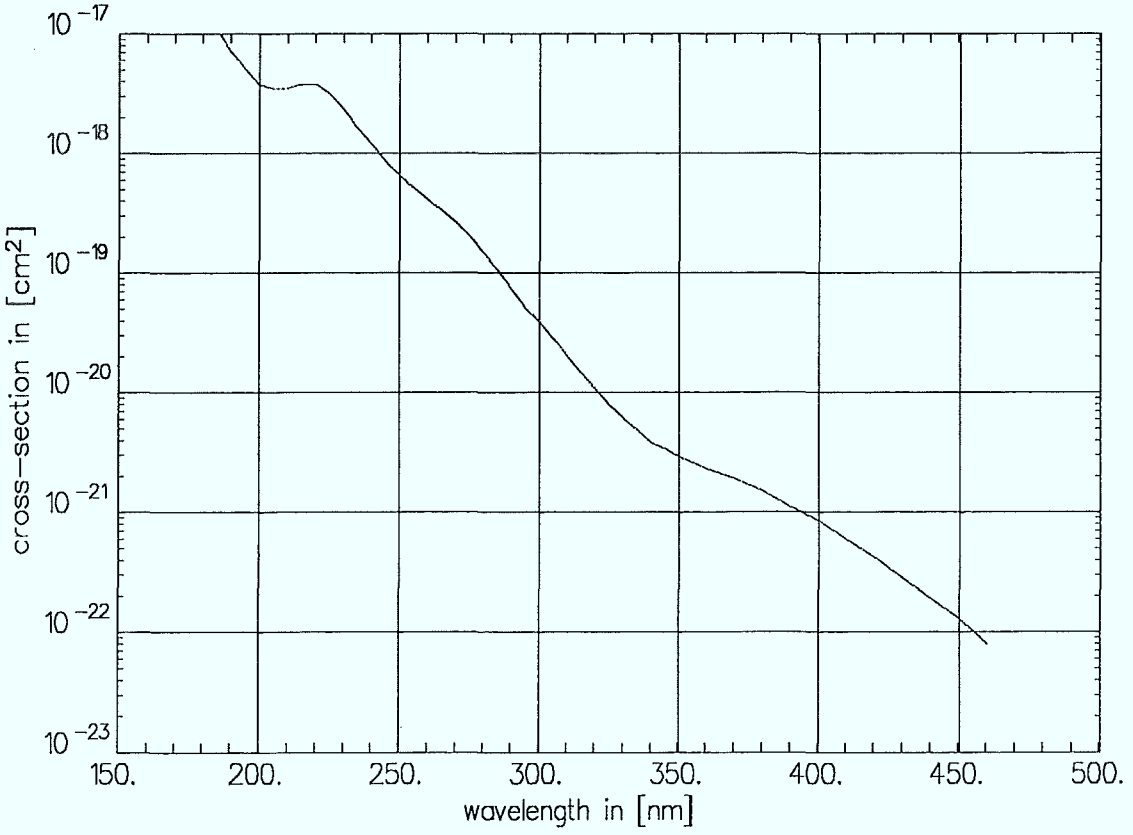
Substance: $ClONO_2$

Reference:
Rowland, F.S., J.E. Spencer, and M.J. Molina, Stratospheric Formation and Photolysis of Chlorine Nitrate, J. Phys. Chem., **80** (1976), 2711-2713

Data: table Resolution: 4.0 - 10.0 nm

Temperature: 298. K

Temperature dependence: no



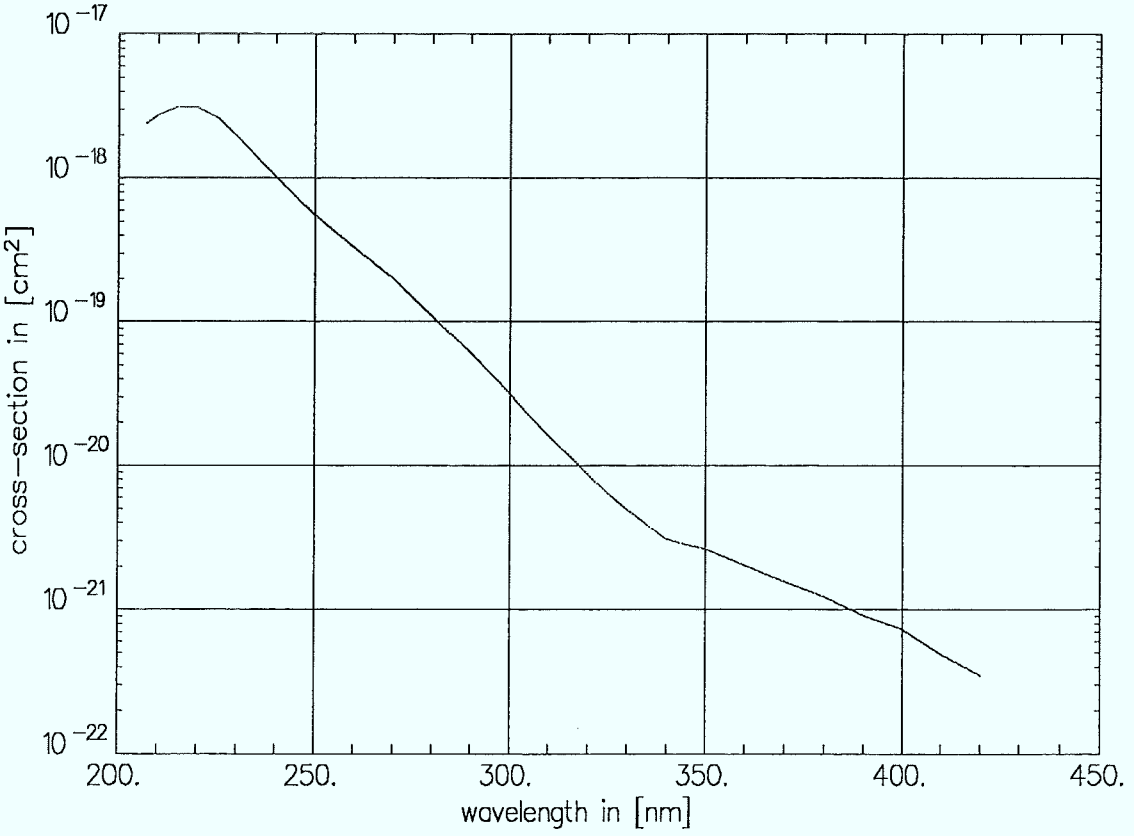
Substance: $ClONO_2$

Reference:
H.-D. Knauth, priv. comm., 1978

Data: table Resolution: 3.0 - 10.0 nm

Temperature: 293. K

Temperature dependence: 293. / 273. / 263. / 253. / 243. / 233. / 223. K



Substance: $ClONO_2$

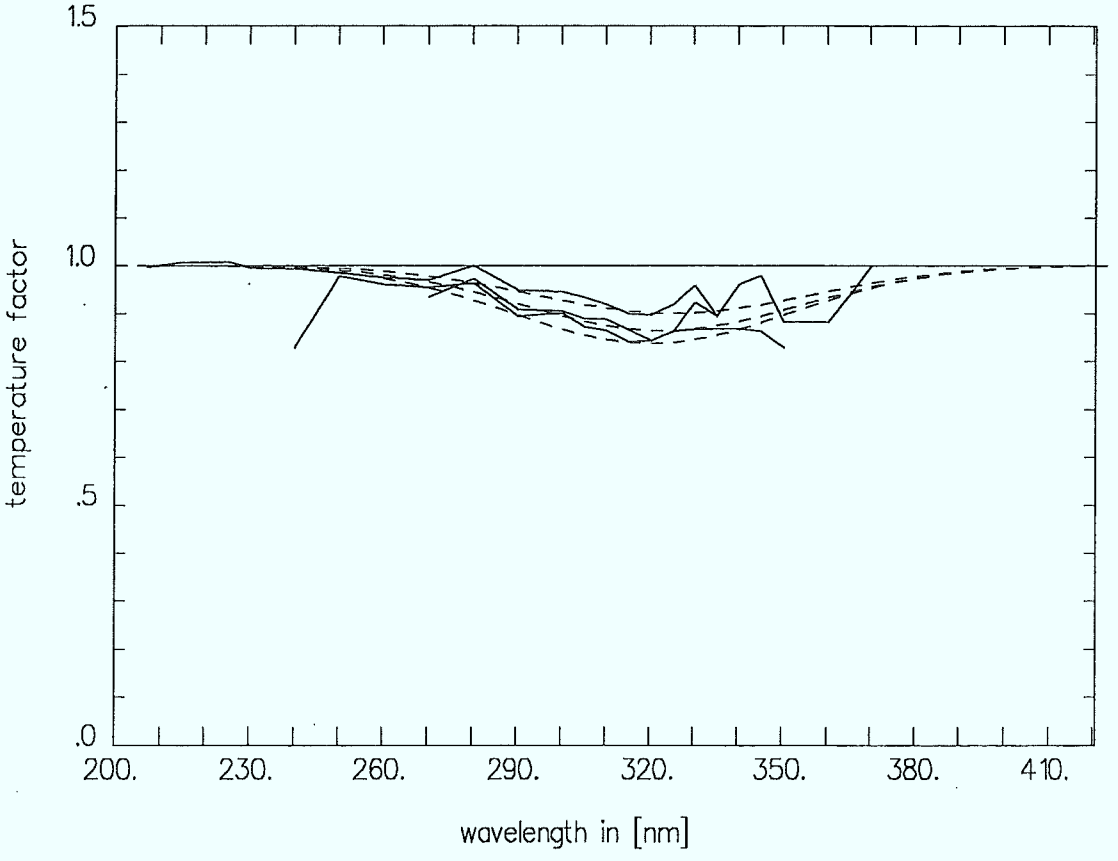
Reference:
H.-D. Knauth, priv. comm., 1978

Temperatures: 293. / 273. / 263. / 253. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 5.932E-3 | b = | -4.66E-5 | c = | -5.E-4 |
| d = | 0. | e = | 256.75 | f = | 0.25 |



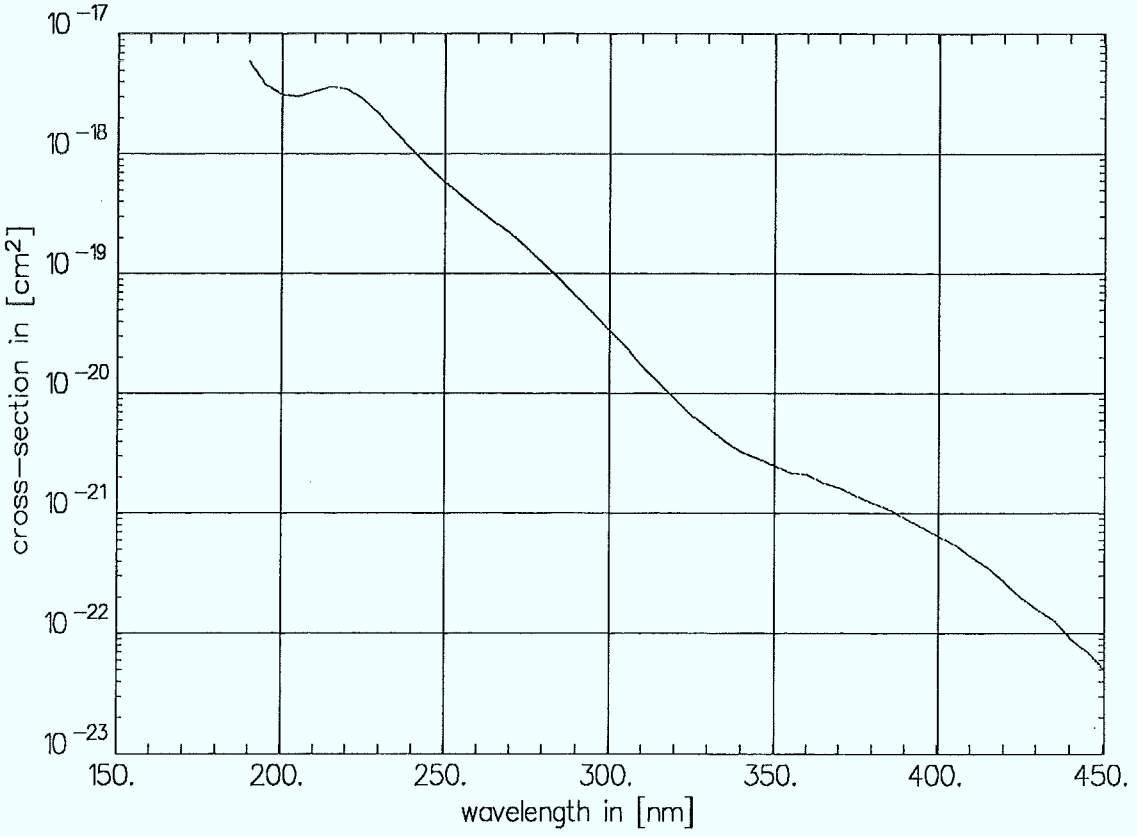
Substance: $ClONO_2$

Reference:
L.T. Molina, and M.J. Molina, Chlorine Nitrate Ultraviolet Absorption Spectrum at Stratospheric Temperatures, J. Photochem., **11** (1979), 139-144

Data: table Resolution: 5.0 nm

Temperature: 296. K

Temperature dependence: 296. / 243. / 227. K



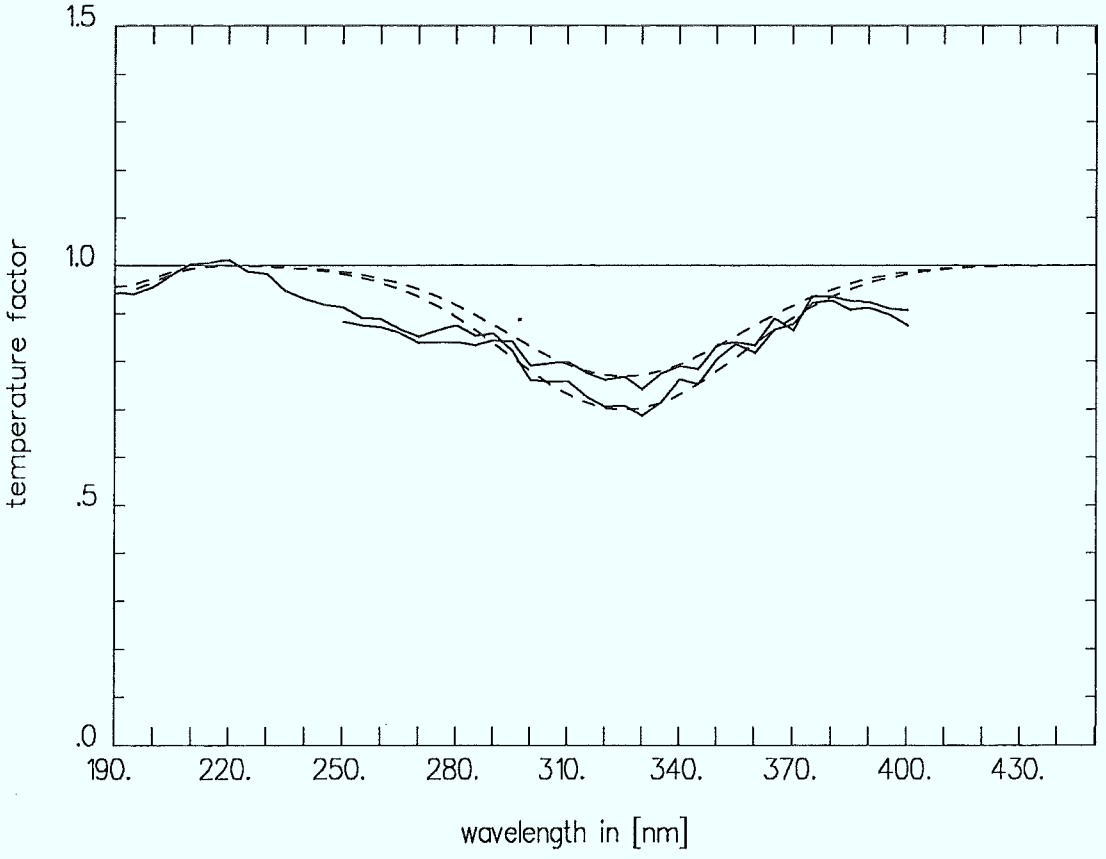
Substance: $ClONO_2$

Reference:
L.T. Molina, and M.J. Molina, Chlorine Nitrate Ultraviolet Absorption Spectrum at Stratospheric Temperatures, J. Photochem., **11** (1979), 139-144

Temperatures: 296. / 243. / 227. K

Function: 3

Fit Parameter: a = 8.45E-4 b = -5.E-3 $\lambda_1$ = 190.
c = 4.37E-3 d = -5.E-4 $\lambda_2$ = 325.



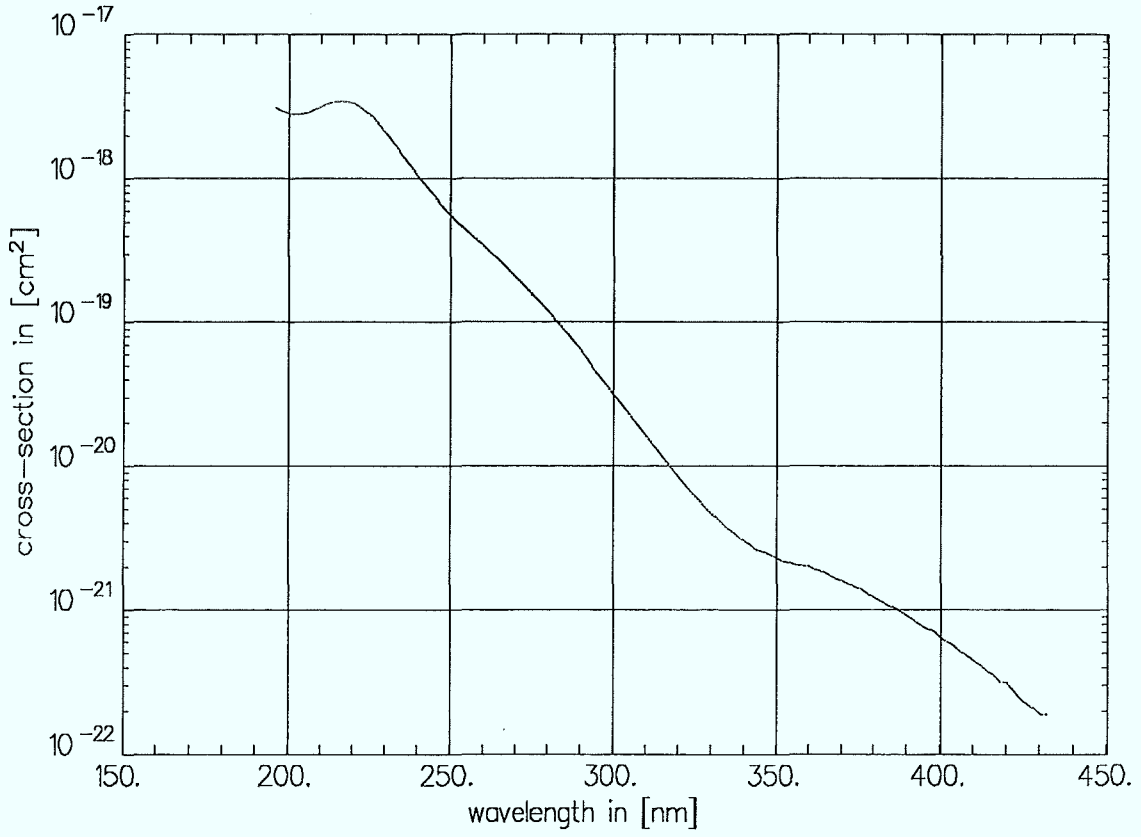
Substance: $ClONO_2$

Reference:
Burkholder, J.B., R.K. Talukdar, and A.R. Ravishankara, Temperature Dependence of the $ClONO_2$ UV Absorption Spectrum, Geophys. Res. Lett., **21** (1994), 585-588

Data: table Resolution: 2.0 nm

Temperature: 296. K

Temperature dependence: no



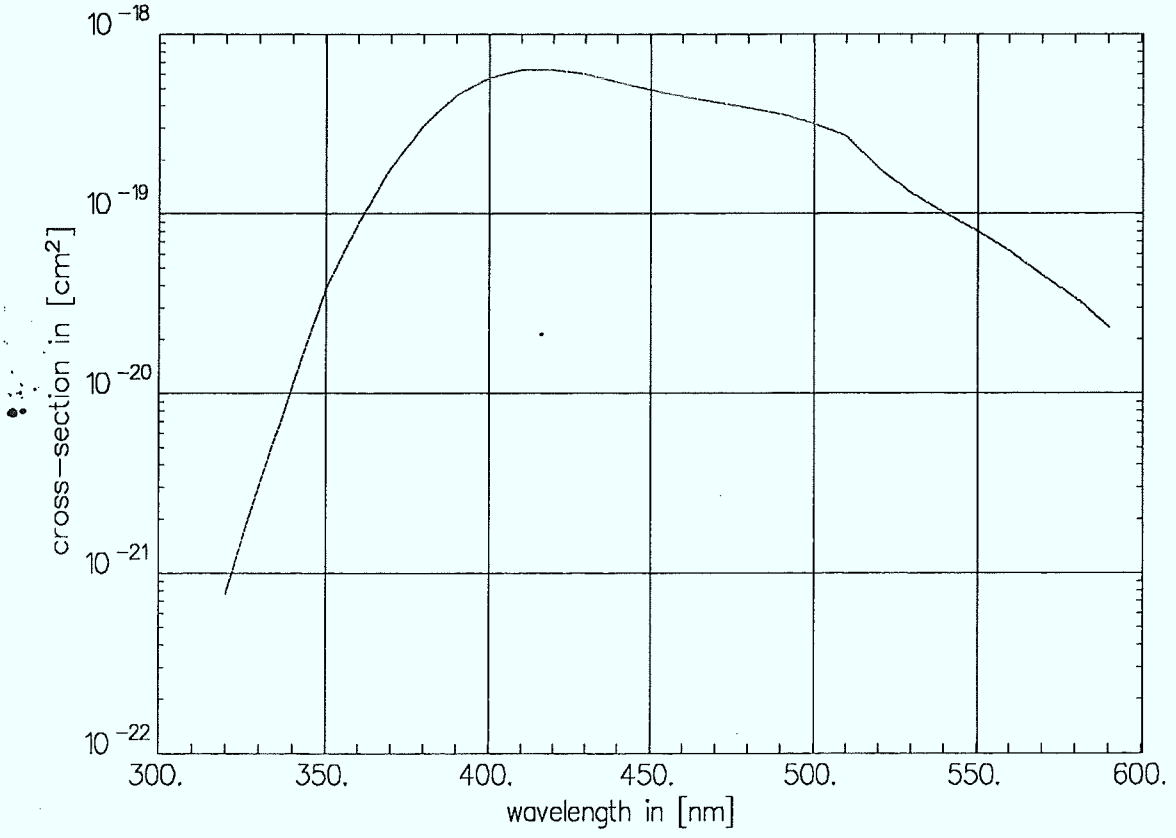
Substance: $Br_2$

Reference:
Seery, D.J., and D. Britton, The Continuous Absorption Spectra of Chlorine, Bromine, Bromine Chloride, Iodine Chloride, and Iodine Bromide, J. Phys. Chem., **68** (1964), 2263-2266

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



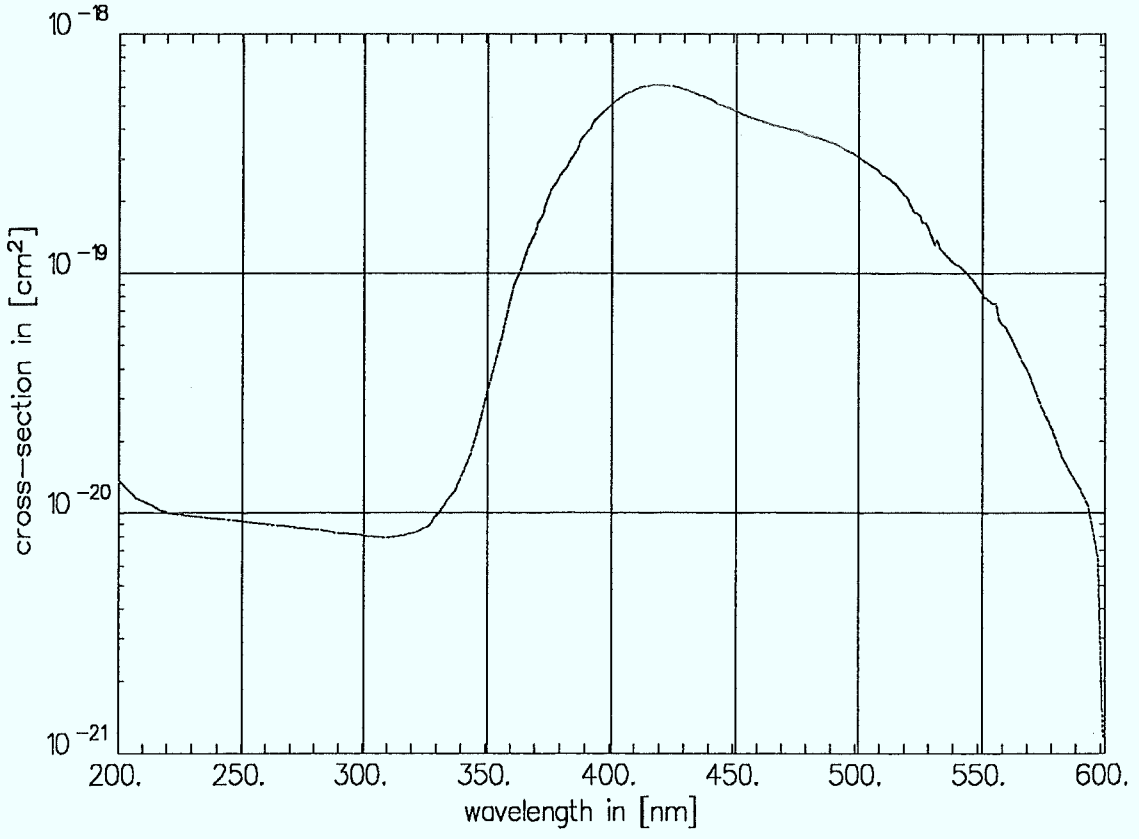
Substance: $Br_2$

Reference:
Veronique McMillan
in Calvert and Pitts, *Photochemistry*, John Wiley & Sons, London, 1966, p. 184

Data: diagram

Temperature: 298. K

Temperature dependence: no



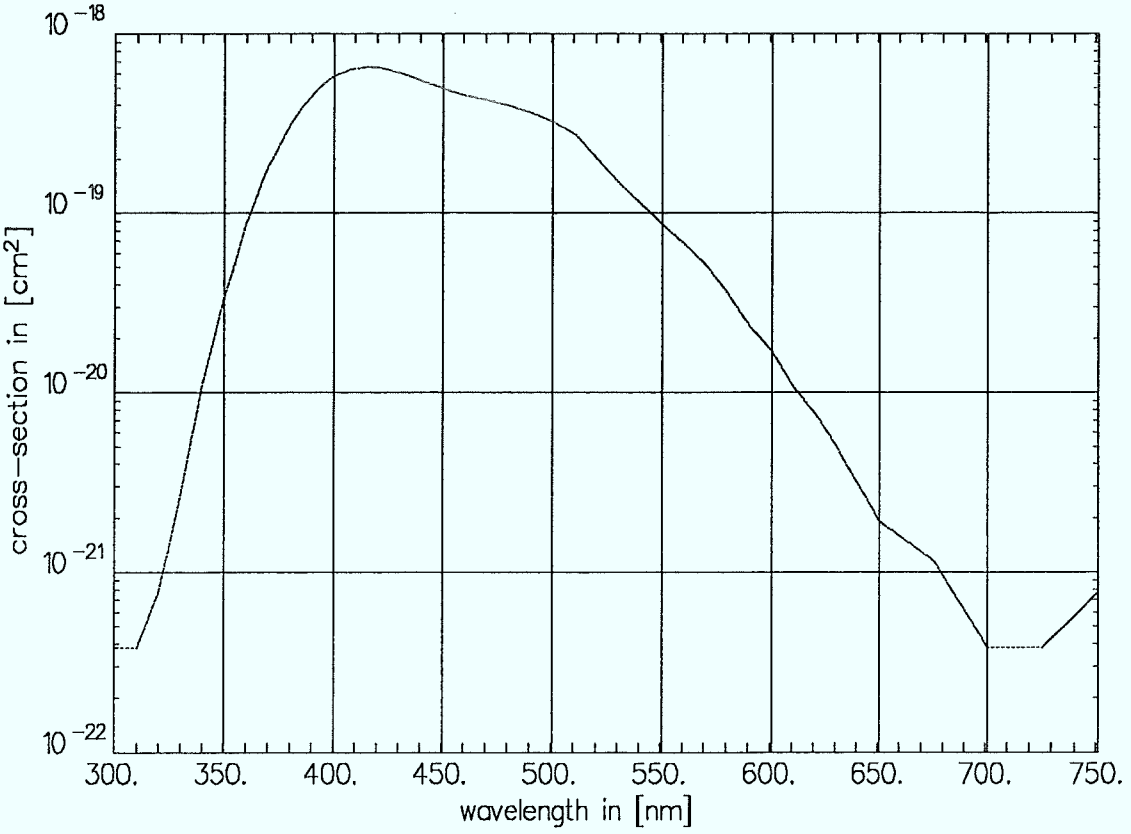
Substance: $Br_2$

Reference:
Passchier, A.A., J.D. Christian and N.W. Gregory, The Ultraviolett-Visible Absorption Spectrum of Bromine between Room Temperature and 440°, J. Phys. Chem., **71** (1967), 937-942

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



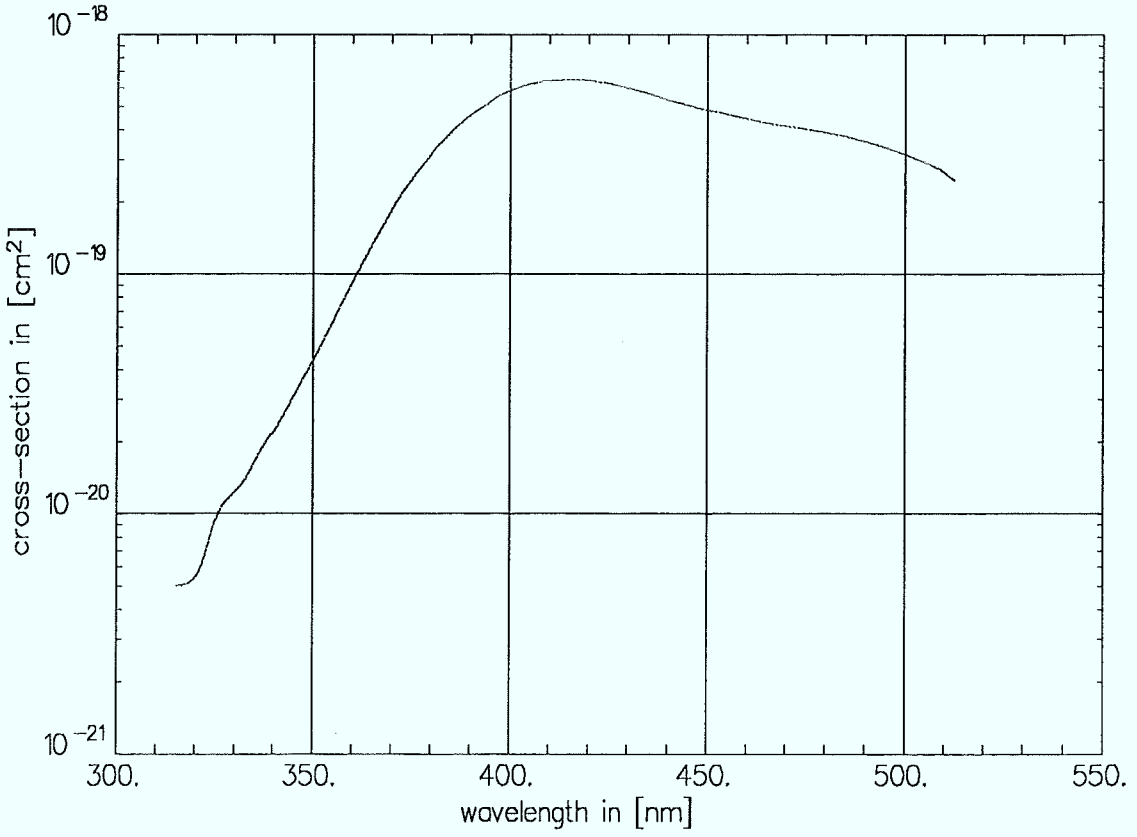
Substance: $Br_2$

Reference:
W. Schneider, and G. von Helden, priv. comm., MPI Mainz, 1991

Data: disk Resolution: 0.2 nm

Temperature: 294. K

Temperature dependence: no



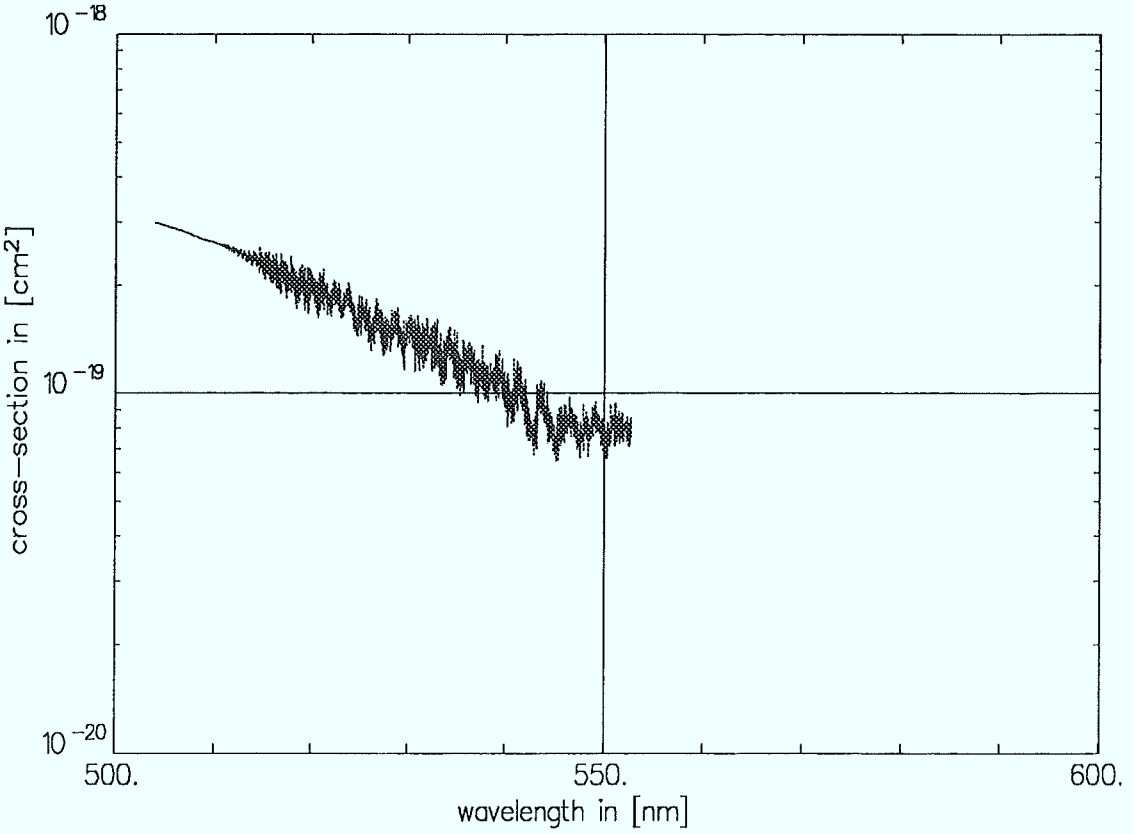
Substance: $Br_2$

Reference:
W. Schneider, and G. von Helden, priv. comm., MPI Mainz, 1991

Data: disk Resolution: 0.005 nm

Temperature: 294. K

Temperature dependence: no



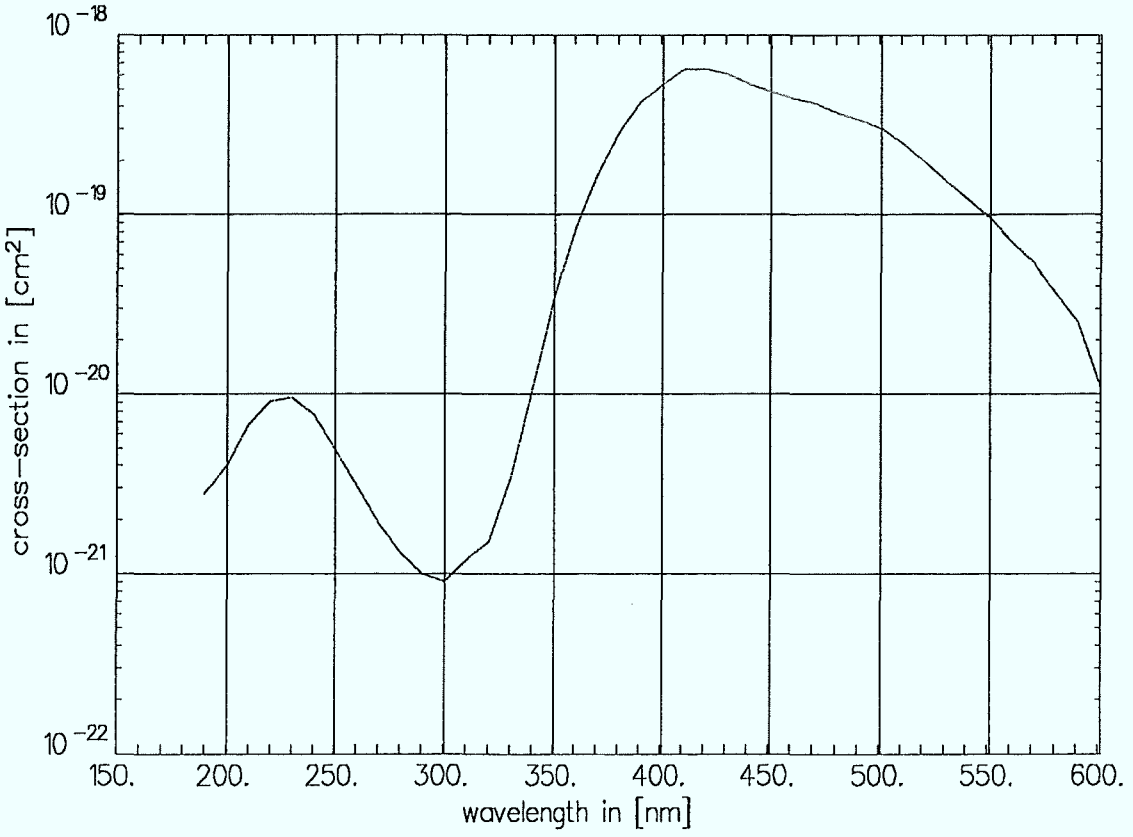
Substance: $Br_2$

Reference:
Hubinger, S., and J.B. Nee, Absorption Spectra of $Cl_2$, $Br_2$ and BrCl between 190 and 600 nm, J. Photochem. Photobiol., **86** (1995), 1-7

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **BrO**

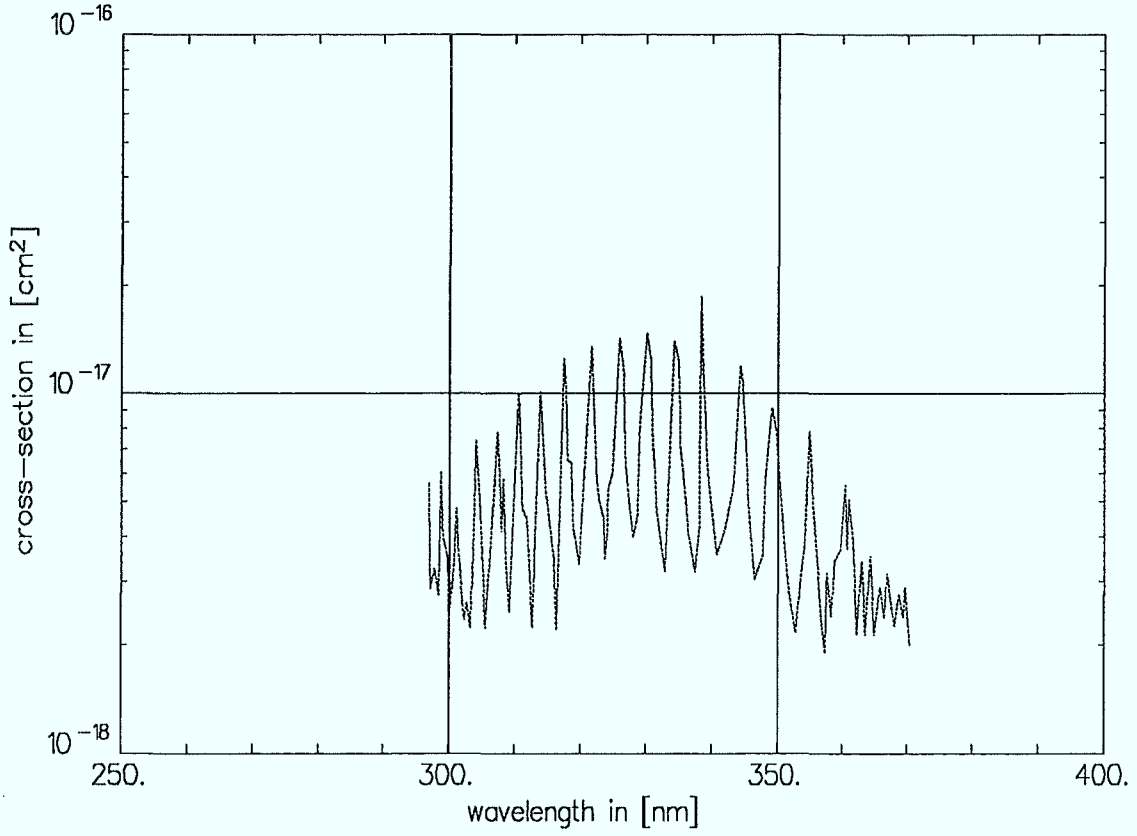
Reference:
Cox, R.A., D.W. Sheppard, and M.P. Stevens, Absorption Coefficients and Kinetics of the BrO Radical Using Molecular Modulation, Journal of Photochemistry, **19** (1982), 189-207

Data: diagram

Temperature: 298. K

Temperature dependence: no

Comment: BrO was generated by photolysis at 254 nm from a $Br_2$-$O_3$ mixture



Substance: **BrO**

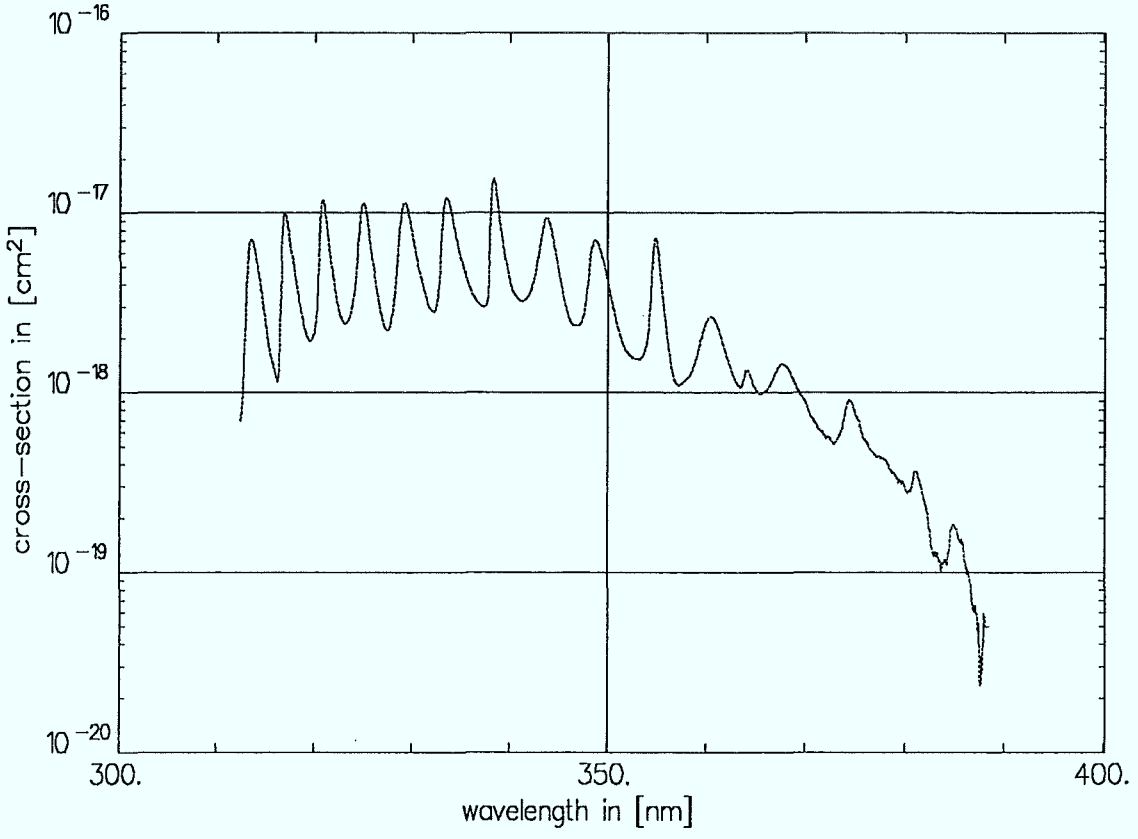
Reference:
Wahner, A., A.R. Ravishankara, S.P. Sander, and R.R. Friedl, Absorption Cross Section of BrO between 312 and 385 nm at 298 and 223 K, Chem. Phys. Lett., **152** (1988), 507-512

Data: disk Resolution: 0.04 nm

Temperature: 298. K

Temperature dependence: 298. / 243. / 228. K

Comment: BrO was generated by photolysis at wavelengths greater than 190 nm from a $Br_2$-$O_2$ mixture



Substance: **BrO**

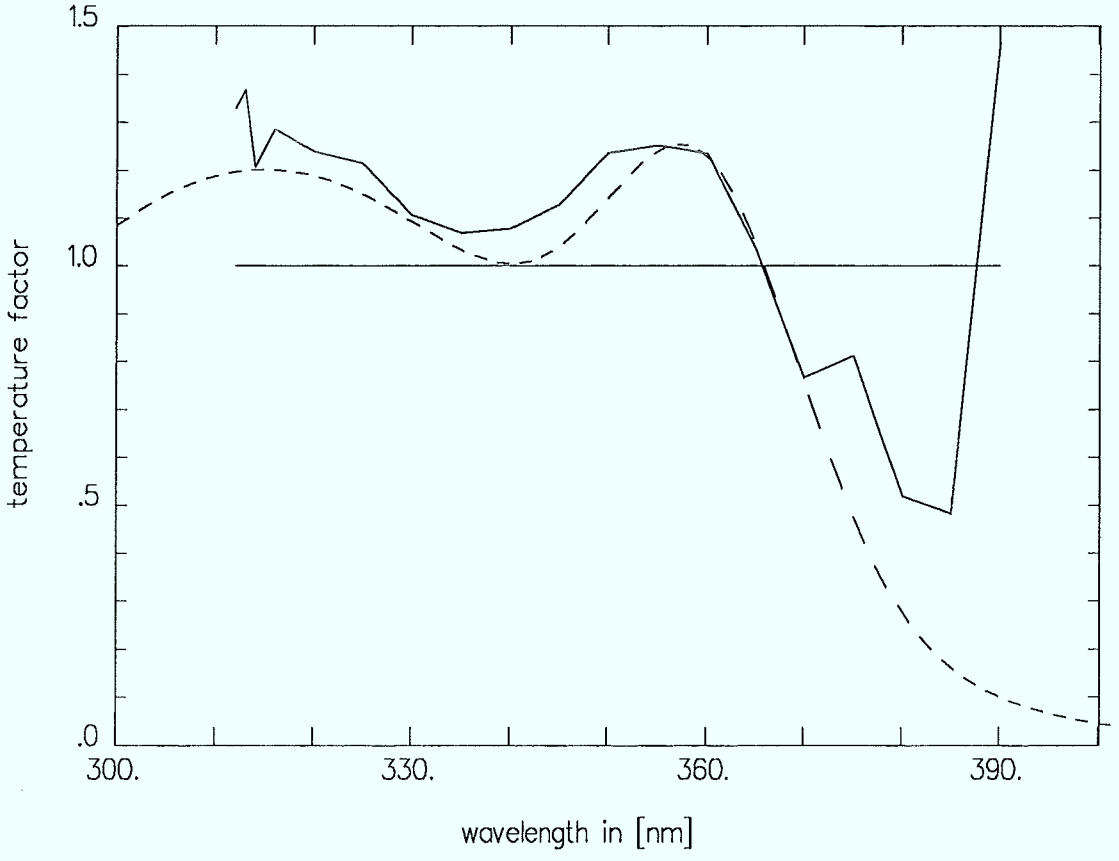
Reference:
Wahner, A., A.R. Ravishankara, S.P. Sander, and R.R. Friedl, Absorption Cross Section of BrO between 312 and 385 nm at 298 and 223 K, Chem. Phys. Lett., **152** (1988), 507-512

Temperatures: 298. / 228. K

Function: 6

Fit Parameter: a = 2.86E-3 $\lambda_{00}$ = 335. $\lambda_0$ = 315.
c = 0.75 d = -10. e = -5E-3 $\lambda_1$ = 360. f =0.

Comment: Temperature dependence from reduced spectra.



Substance: **$Br_2O$**

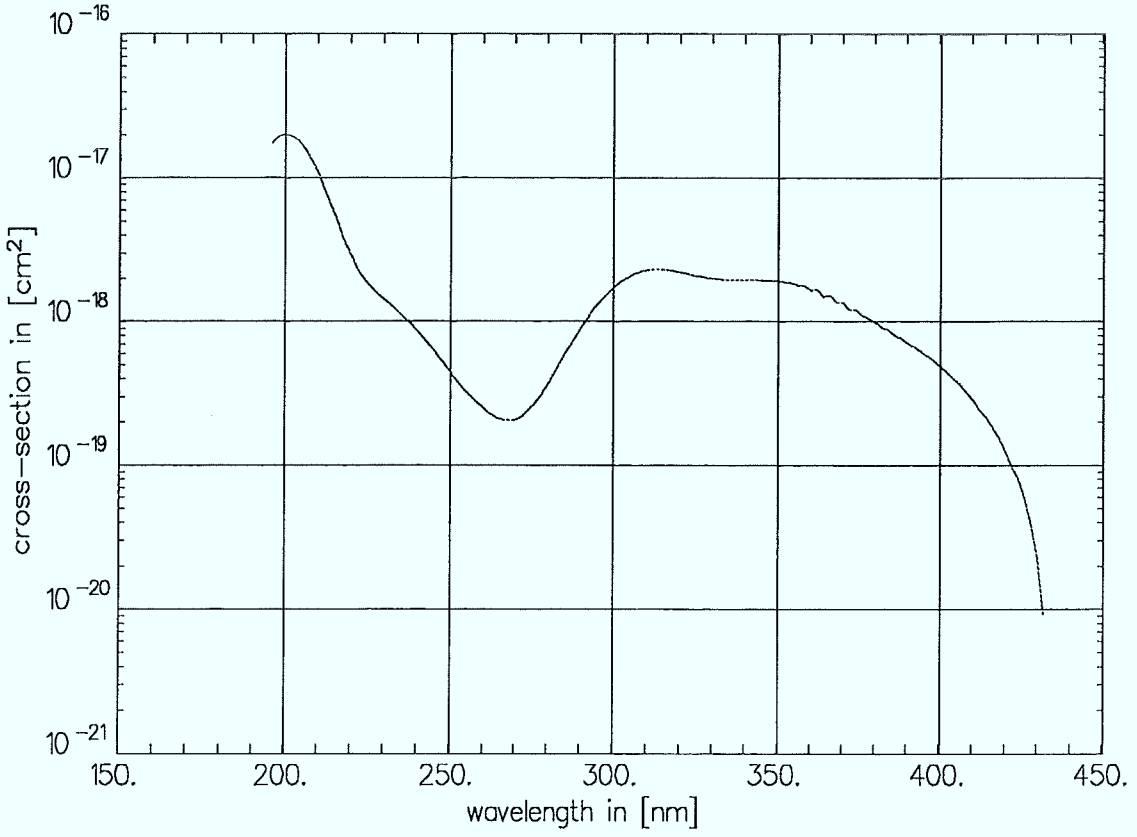
Reference:
Orlando, J.J., and J.B. Burkholder, Gas Phase UV/Visible Absorption Spectra of HOBr and $Br_2O$, J. Phys. Chem., **99** (1994), 1143-1150.

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: $Br_2O$ was synthesized via rection of $Br_2$ with HgO. $Br_2O$ could not be obtained free of $Br_2$ contamination. $Br_2O$ absorption cross sections should be treated as an upper limit.



Substance: $Br_2O$

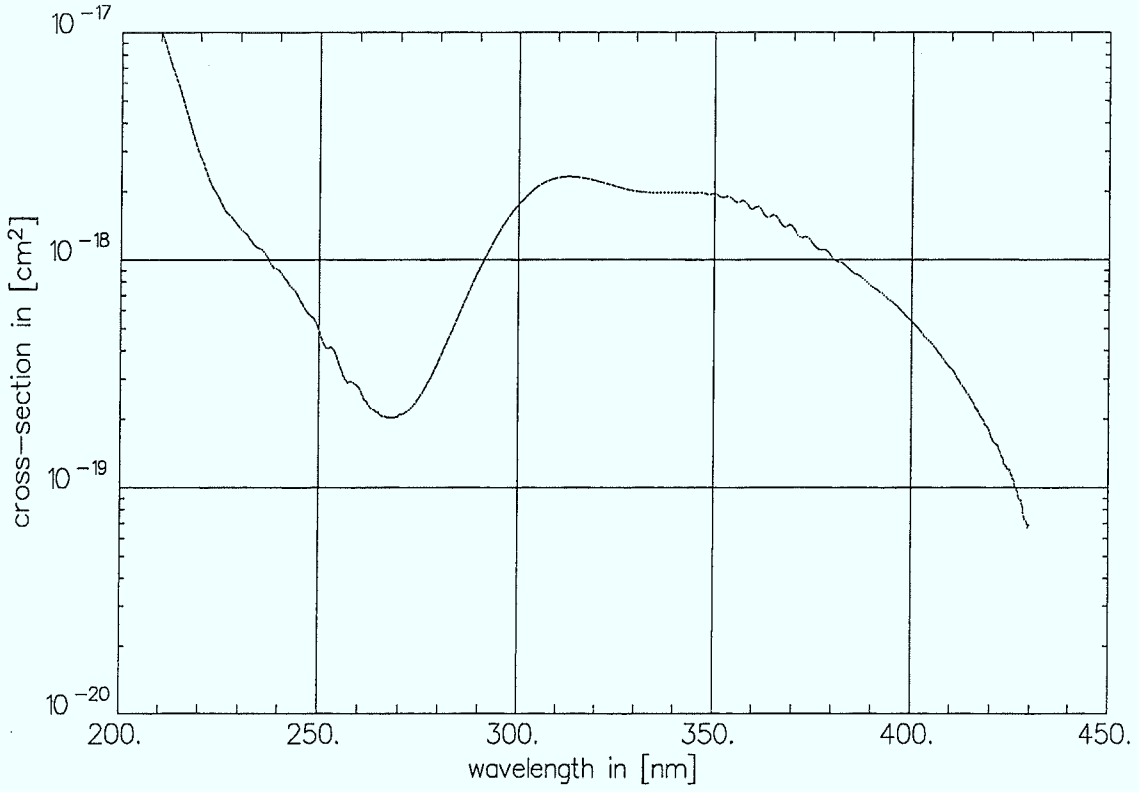
Reference:
Deters, B., J.P. Burrows, S. Himmelmann, and C. Blindauer, Gas Phase Spectra of HOBr and $Br_2O$ and their Atmospheric Significance, submitted to Annales Geophysicae (1995)

Data: disk Resolution: 0.16 nm

Temperature: 298. K

Temperature dependence: no

Comment: $Br_2O$ was synthesized via rection of $Br_2$ with HgO. $Br_2O$ could not be obtained free of $Br_2$ contamination.



Substance: **BrCl**

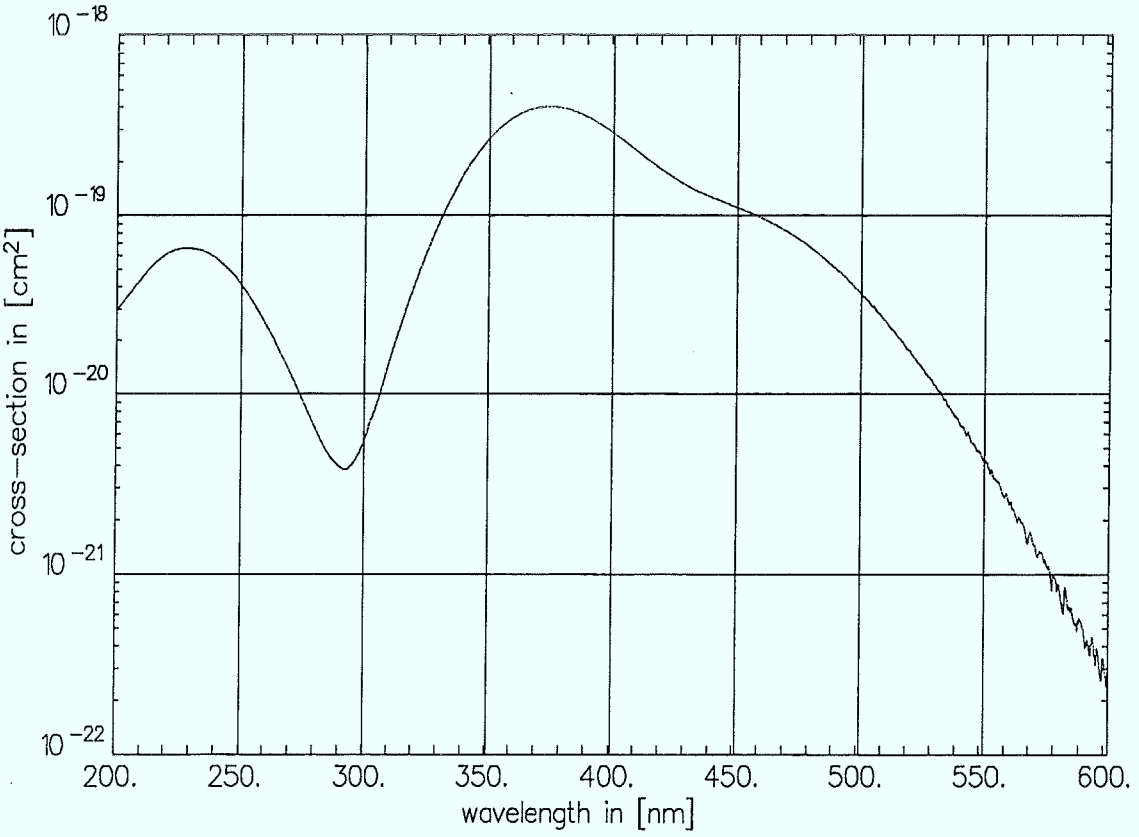
Reference:
Maric, D., J.P. Burrows, and G.K. Moortgat, A Study of the UV-Visible Absorption Spectra of $Br_2$ and BrCl, J. Photochem. Photobiol. A: Chem., **83** (1994), 179-192

Data: disk Resolution: 0.067 nm

Temperature: 298. K

Temperature dependence: no

Comment: Contributions of $Cl_2$ and $Br_2$ subtracted



Substance: **BrCl**

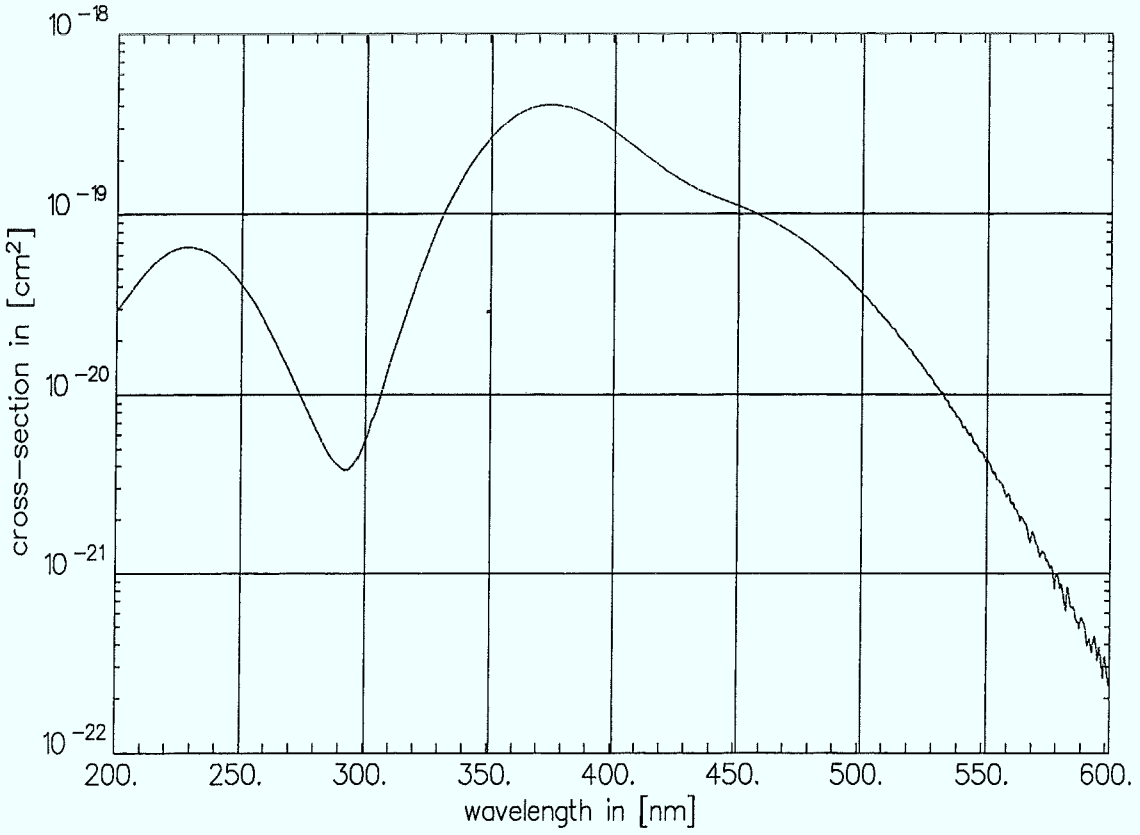
Reference:
Maric, D., J.P. Burrows, and G.K. Moortgat, A Study of the UV-Visible Absorption Spectra of $Br_2$ and BrCl, J. Photochem. Photobiol. A: Chem., **83** (1994), 179-192

Data: disk Resolution: 0.25 nm

Temperature: 298. K

Temperature dependence: no

Comment: Spectrum corrected for $Cl_2$ and $Br_2$



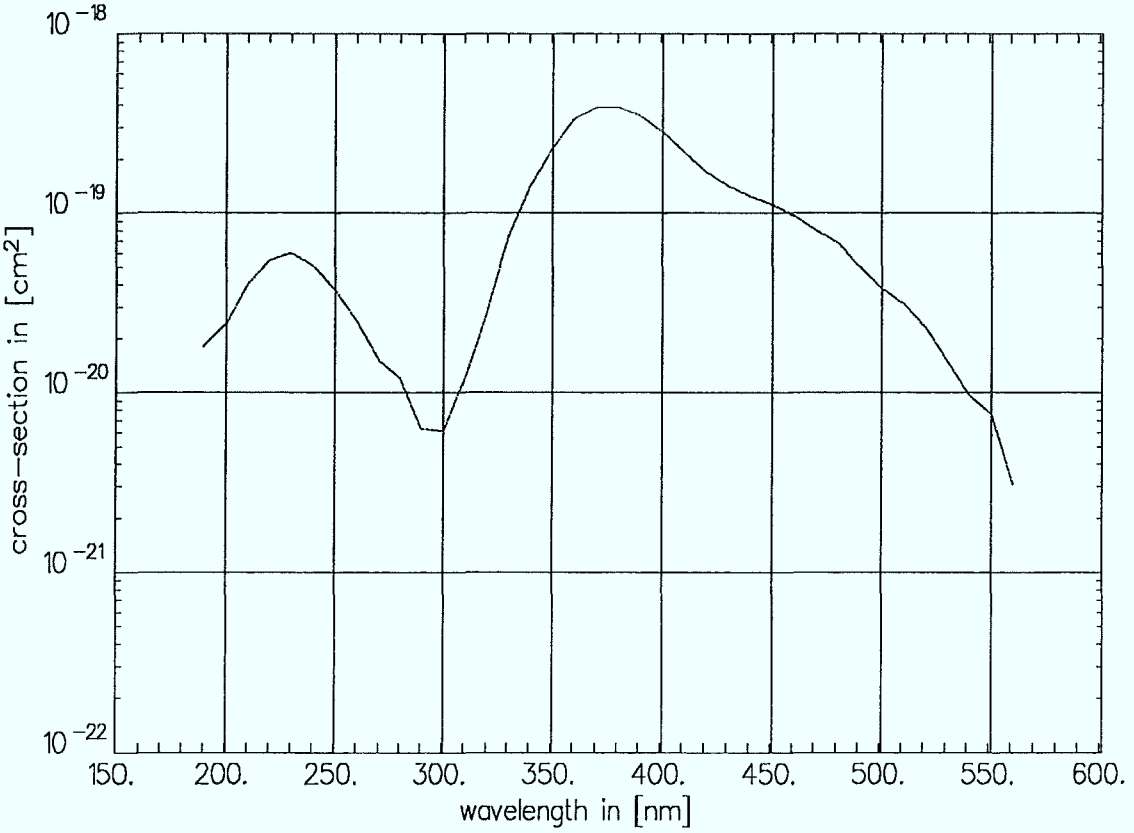
Substance: **BrCl**

Reference:
Hubinger, S., and J.B. Nee, Absorption Spectra of $Cl_2$, $Br_2$ and BrCl between 190 and 600 nm, J. Photochem. Photobiol., **86** (1995), 1-7

Data: table Resolution: 10.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **HOBr**

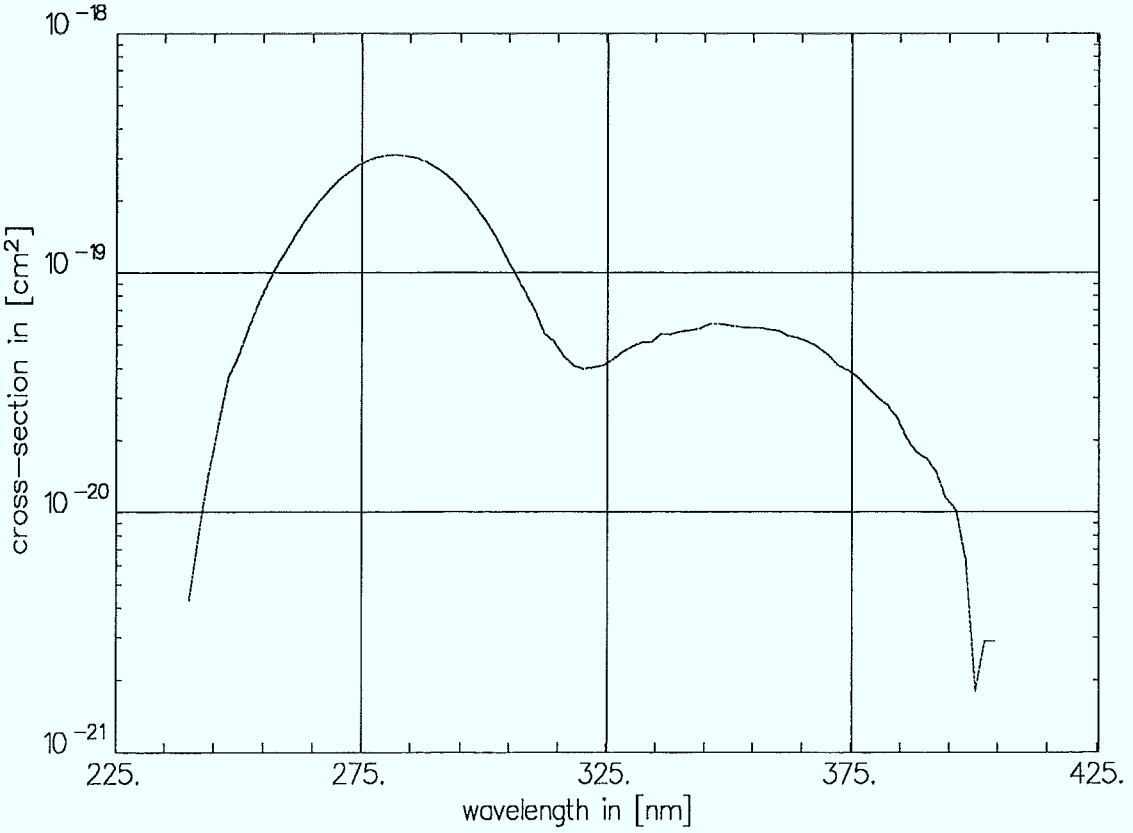
Reference:
Orlando, J.J., and J.B. Burkholder, Gas Phase UV/Visible Absorption Spectra of HOBr and $Br_2O$, J. Phys. Chem., **99** (1994), 1143-1150.

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no

Comment: HOBr was prepared by reaction of $Br_2O$ with $H_2O$. $Br_2O$ was synthesized via rection of $Br_2$ with HgO. $Br_2O$ could not be obtained free of $Br_2$ contamination.



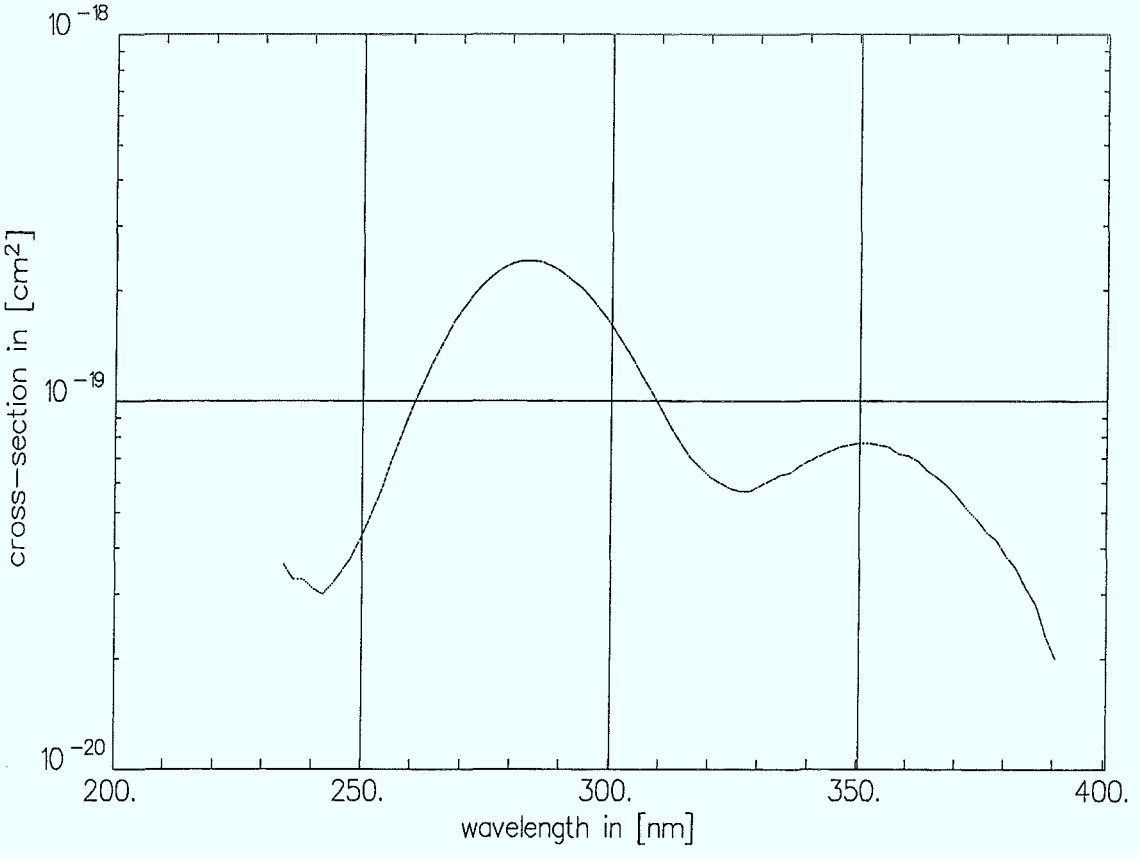
Substance: **HOBr**

Reference:
Benter, Th., Chr. Feldmann, U. Kirchner, M. Schmidt, S. Schmidt, and R.N. Schindler, UV/VIS-Absorption Spectra of HOBr and $CH_3OBr$; $Br(^2P_{3/2})$ Atom Yields in the Photolysis of HOBr, Ber. Bunsenges. Phys. Chem., **99** (1995), 1144-1147.

Data: table Resolution: 2.0 nm

Temperature: 298. K

Temperature dependence: no



Substance: **HOBr**

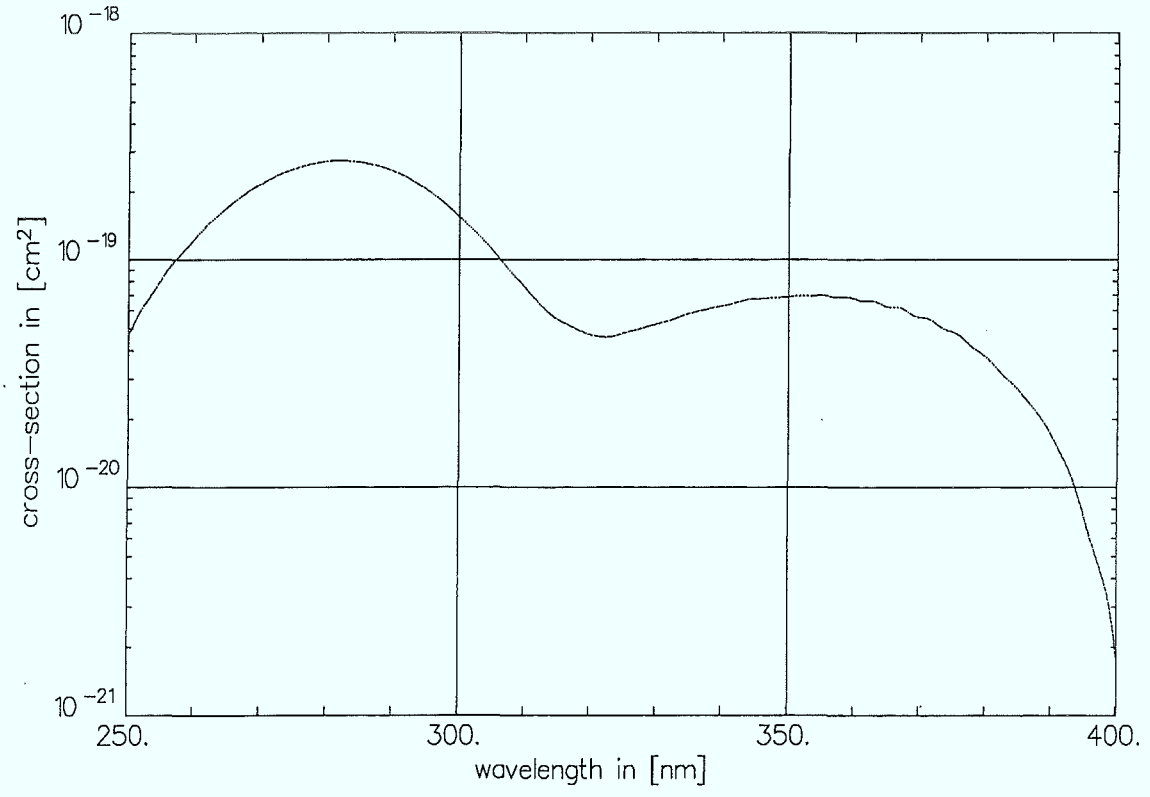
Reference:
Deters, B., J.P. Burrows, S. Himmelmann, and C. Blindauer, Gas Phase Spectra of HOBr and $Br_2O$ and their Atmospheric Significance, submitted to Annales Geophysicae (1995)

Data: disk Resolution: 0.16 nm

Temperature: 298. K

Temperature dependence: no

Comment: HOBr was prepared by reaction of $Br_2O$ with $H_2O$. $Br_2O$ was synthesized via rection of $Br_2$ with HgO. $Br_2O$ could not be obtained free of $Br_2$ contamination.



Substance: **BrNO3**

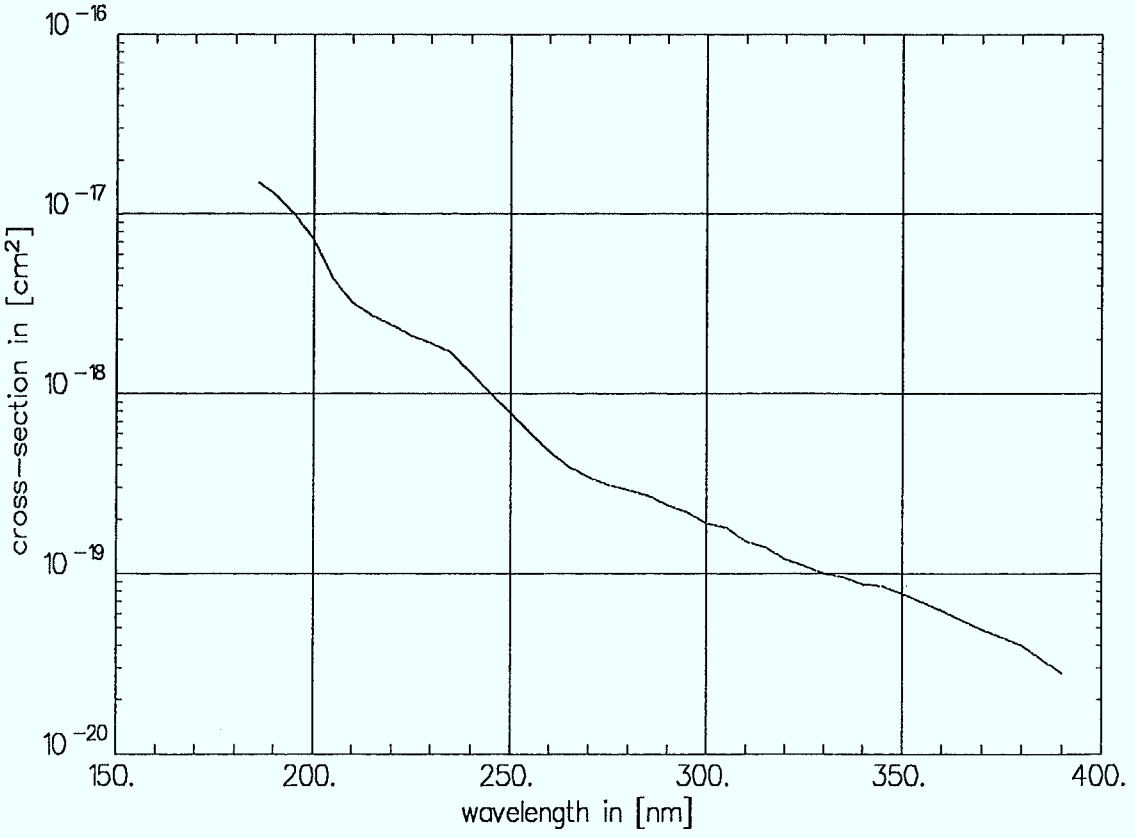
Reference:
Spencer and Rowland, Bromine Nitrate and Its Stratospheric Significance, Journal of Physical Chemistry, **82** (1978), 7-10

Data: table Resolution: 4.0-10.0 nm

Temperature: K

Temperature dependence: no

Comments: All values for wavelengths greater than or equal to 340 nm were corrected for the presence of $Br_2$ at levels of 3-8 % in various samples.



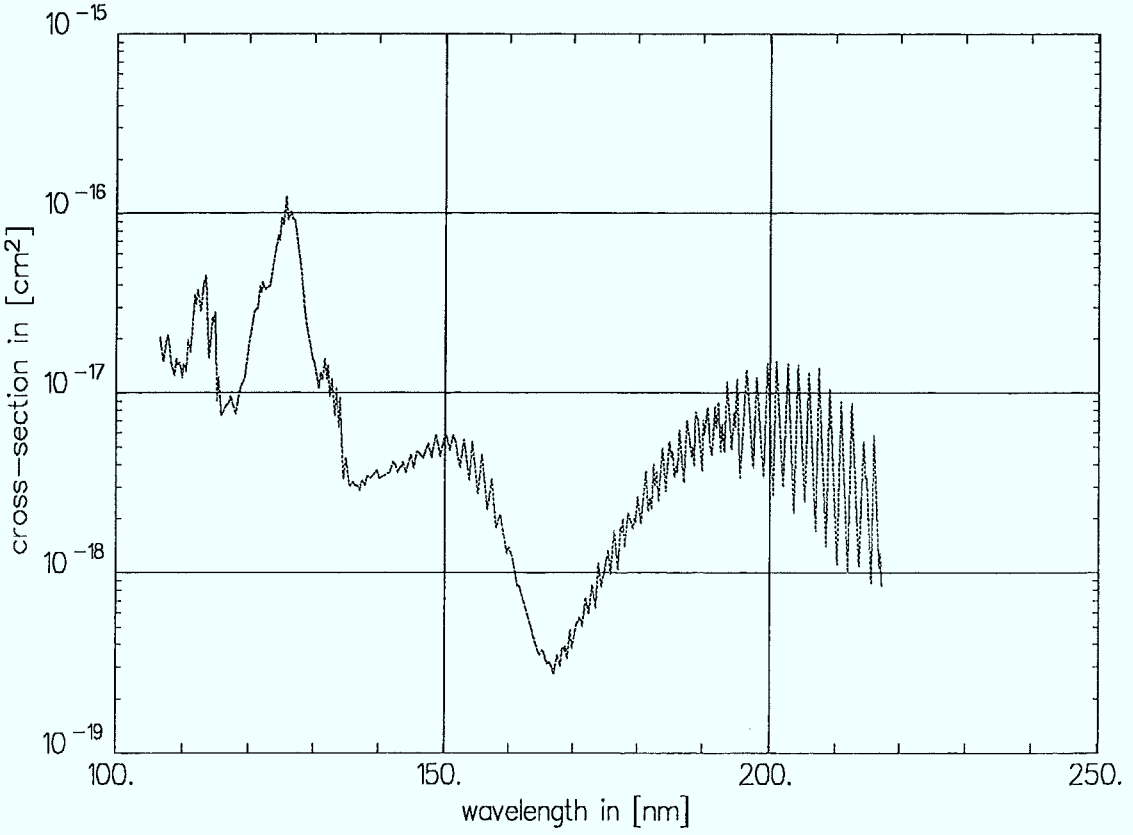
Substance: $SO_2$

Reference:
Golomb, D., K. Watanabe, and F.F. Marmo, Absorption Coefficients of Sulfur Dioxide in the Vacuum Ultraviolet, J. Chem. Phys., **36** (1962), 958-960

Data: diagram

Temperature: 298. K

Temperature dependence: no



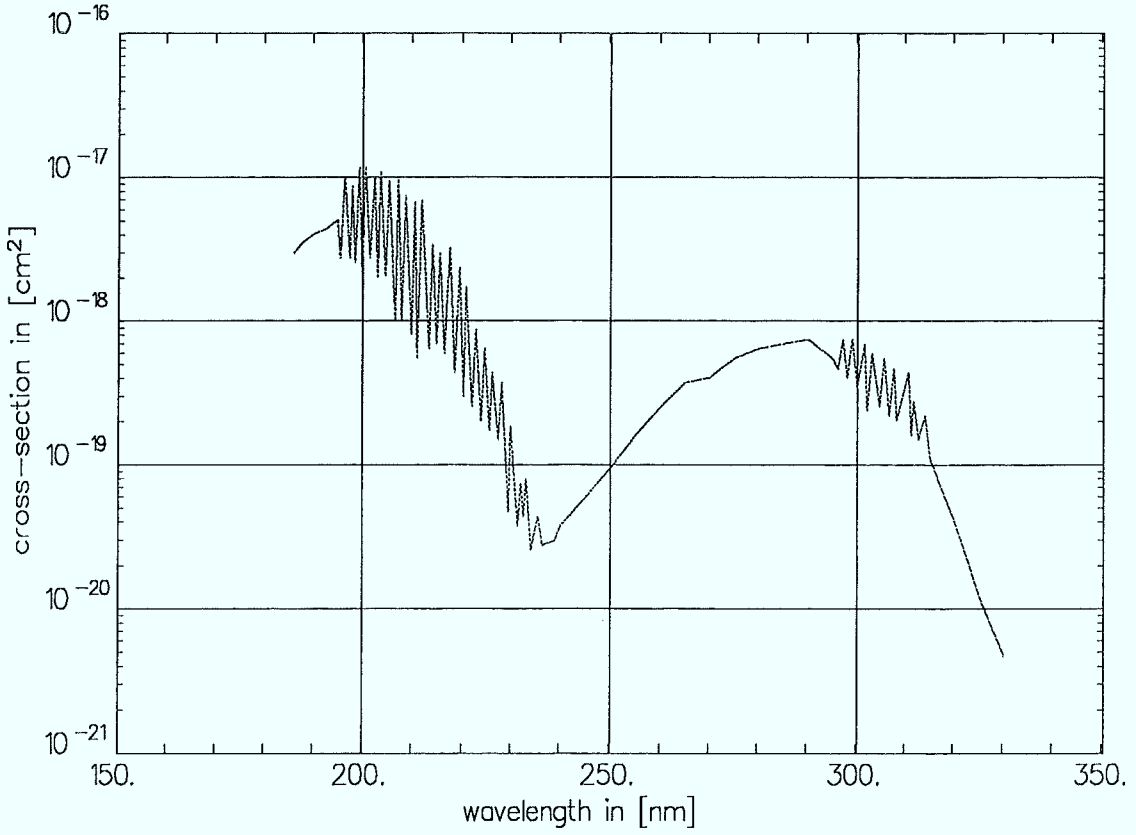
Substance: $SO_2$

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



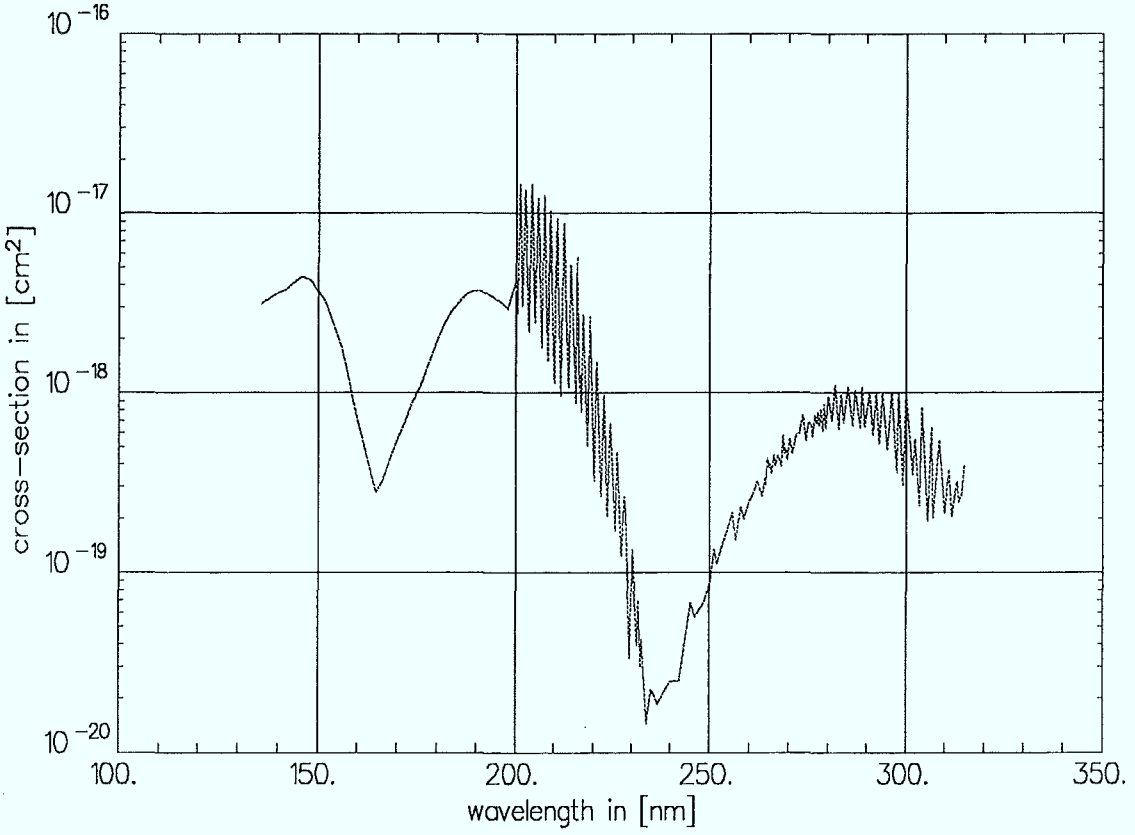
Substance: $SO_2$

Reference:
Warneck, P., F.F. Marmo, and J.O. Sullivan, Ultraviolet Absorption of $SO_2$: Dissociation Energies of $SO_2$ and SO, J. Chem. Phys., **40** (1964), 1132-1136

Data: diagram

Temperature: 298. K

Temperature dependence: no



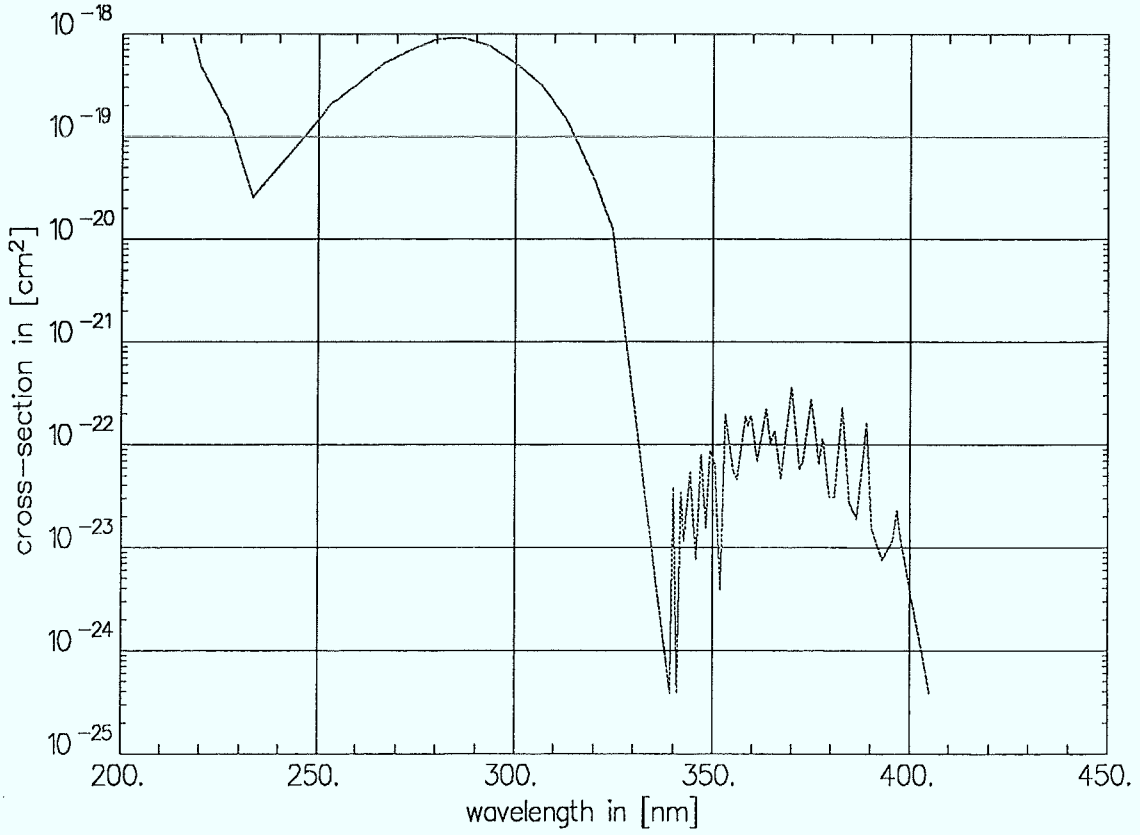
Substance: $SO_2$

Reference:
Sidebottom, H.W., C.C. Badcock, G.E. Jackson, J.G. Calvert, G.W. Reinhardt, and E.K. Damon, Photooxidation of Sulfur Dioxide in the Vacuum Ultraviolet, Environm. Sci. Technol., **6** (1972), 72-79

Data: diagram

Temperature: 298. K

Temperature dependence: no



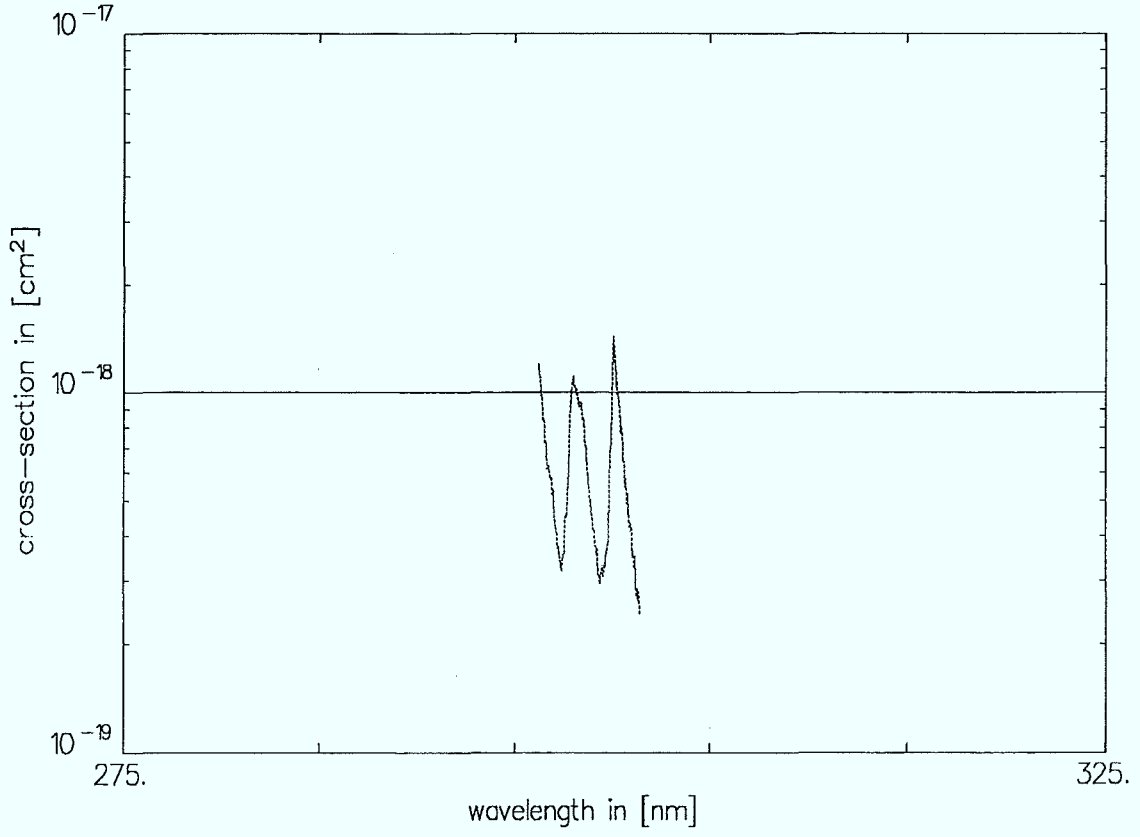
Substance: $SO_2$

Reference:
Thompson, Jr., R.T., J.M. Hoell, Jr., and WR. Wade, Measurements of $SO_2$ Absorption Coefficients Using a Tunable Dye Laser, J. Appl. Phys., **46** (1975), 3040-3043

Data: diagram

Temperature: 298. K

Temperature dependence: no



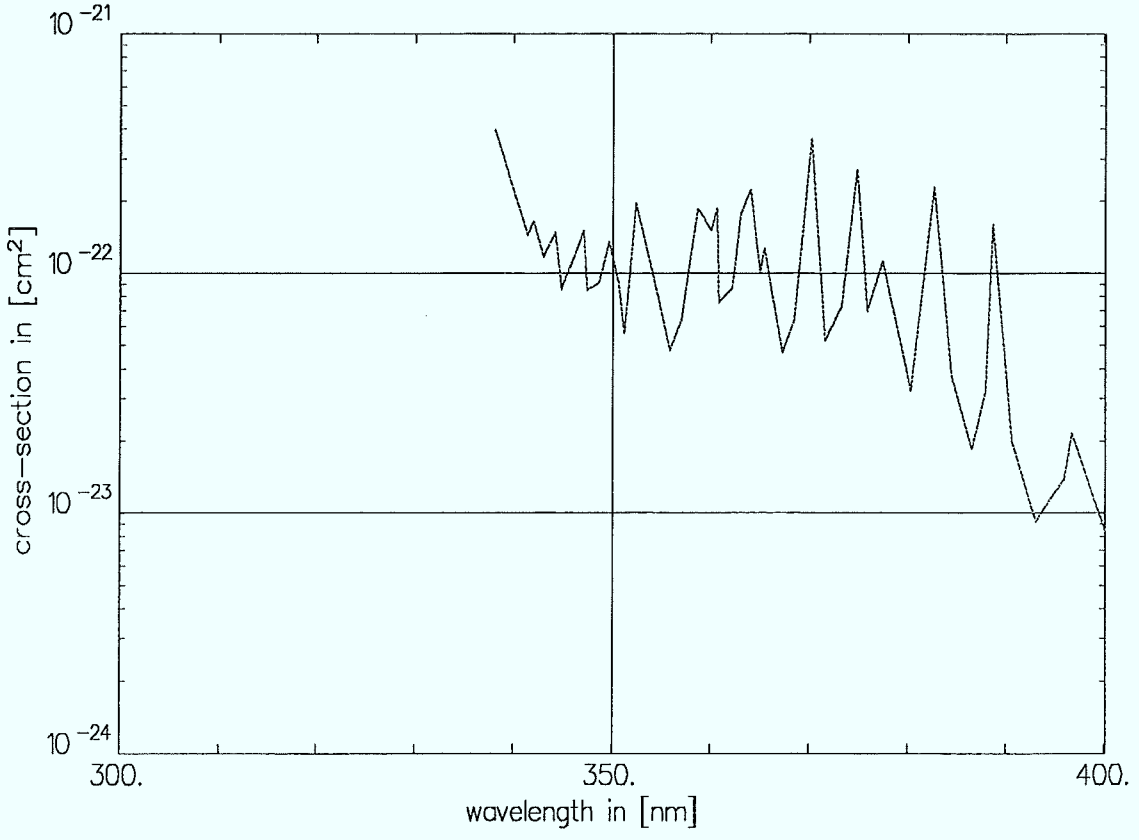
Substance: $SO_2$

Reference:
Kelly, N., J.F. Meagher, and J. Heicklen, The Photolysis of Sulfur Dioxide in the Presence of Foreign Gases. VIII: Excitation of $SO_2$ at 3600 - 4100 A in the Presence of Acetylene, J. Photochem., **6** (1976/77), 157-172

Data: diagram

Temperature: 298. K

Temperature dependence: no



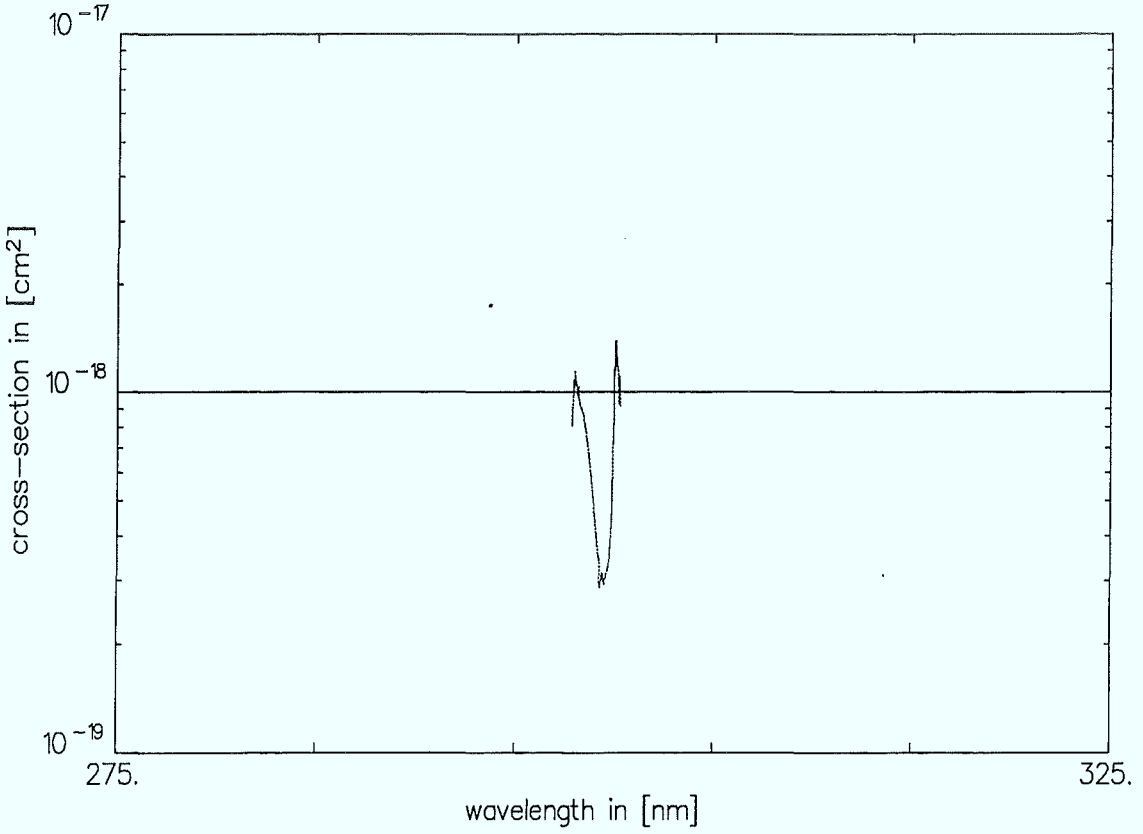
Substance: $SO_2$

Reference:
Woods, P.T., B.W. Jollife, and B.R. Marx, High Resolution Spectroscopy of $SO_2$ Using a Double Pulsed Dye Laser, With Application to the Remote Sensing of Atmospheric Pollutants, Opt. Commun. **33** (1980), 281

Data: disk Resolution: 0.004 nm

Temperature: 293. K

Temperature dependence: no



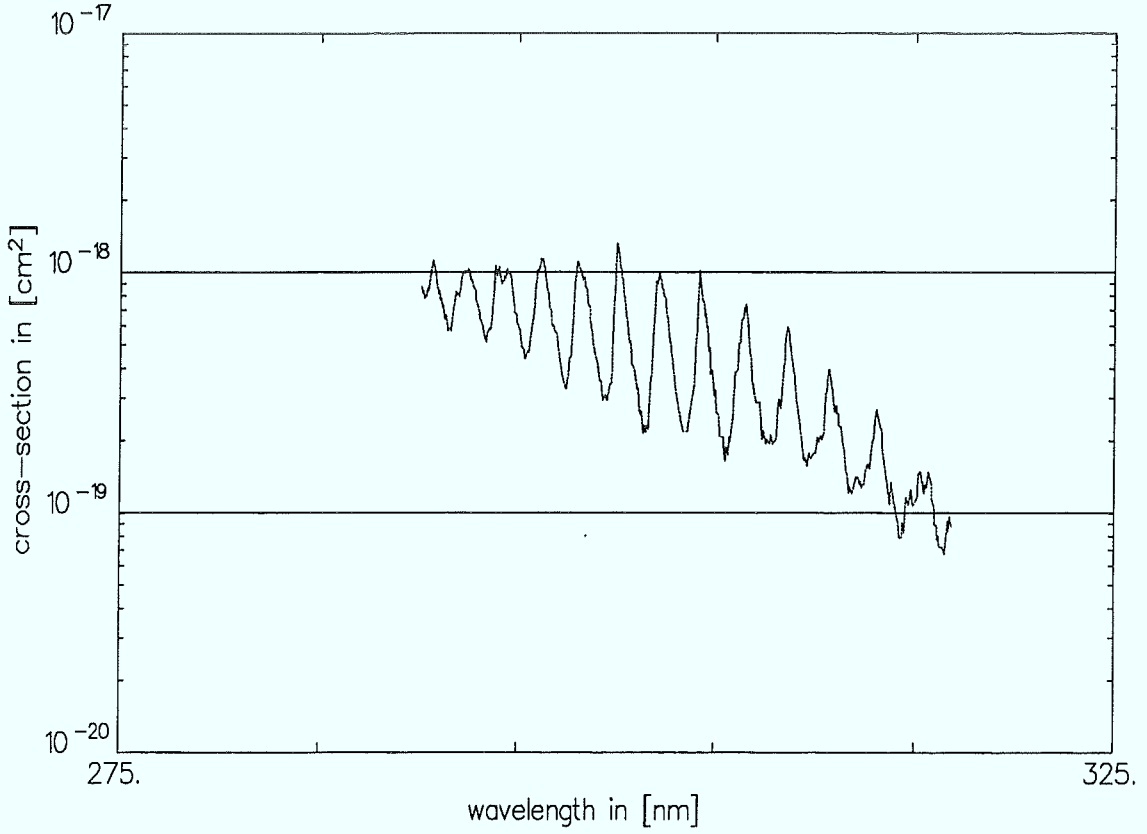
Substance: $SO_2$

Reference:
Brassington, D.J., Sulfur Dioxide Absorption Cross-Section Measurements from 290 nm to 317 nm, Appl. Optics, **20** (1981), 3774-3779

Data: diagram

Temperature: 294. K

Temperature dependence: no



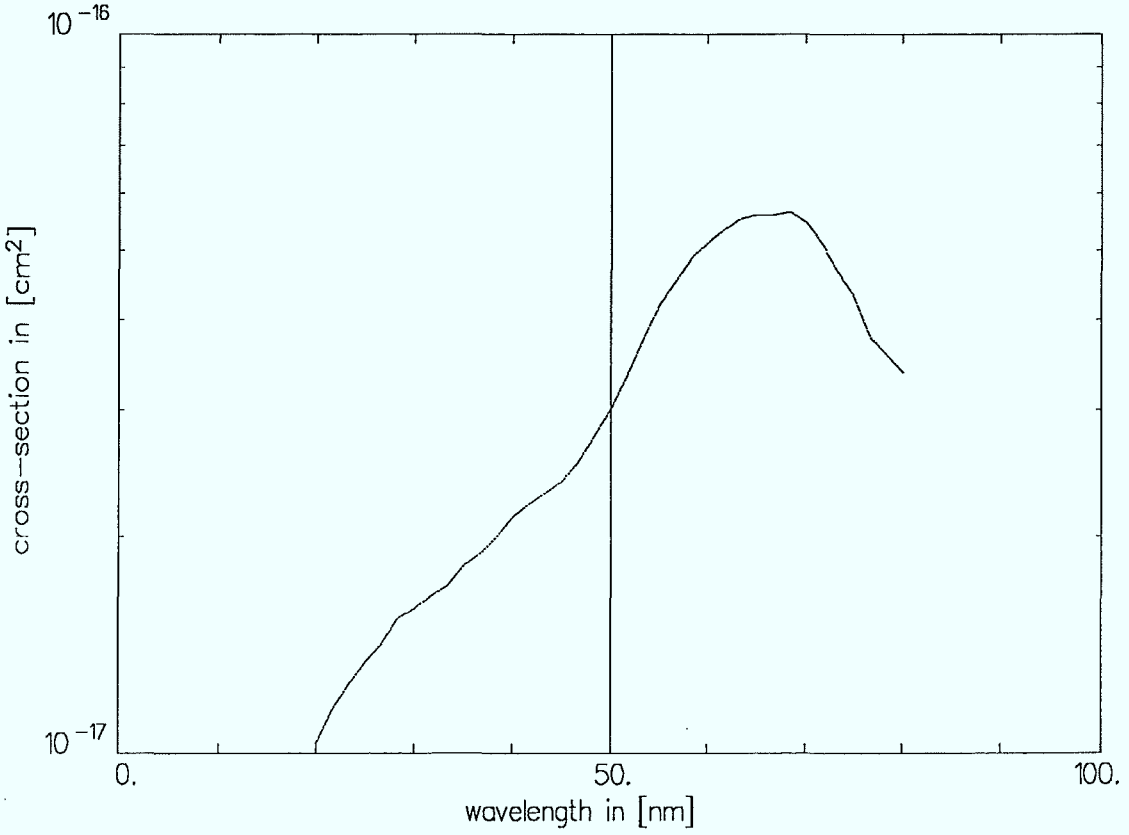
Substance: $SO_2$

Reference:
Wu, C.Y.R., and D.L. Judge, Study of Sulfur-Containing Molecules in the EUV Region. I. Photoabsorption Cross Section of $SO_2$, J. Chem. Phys., **74** (1981), 3804-3806

Data: diagram

Temperature: 298. K

Temperature dependence: no



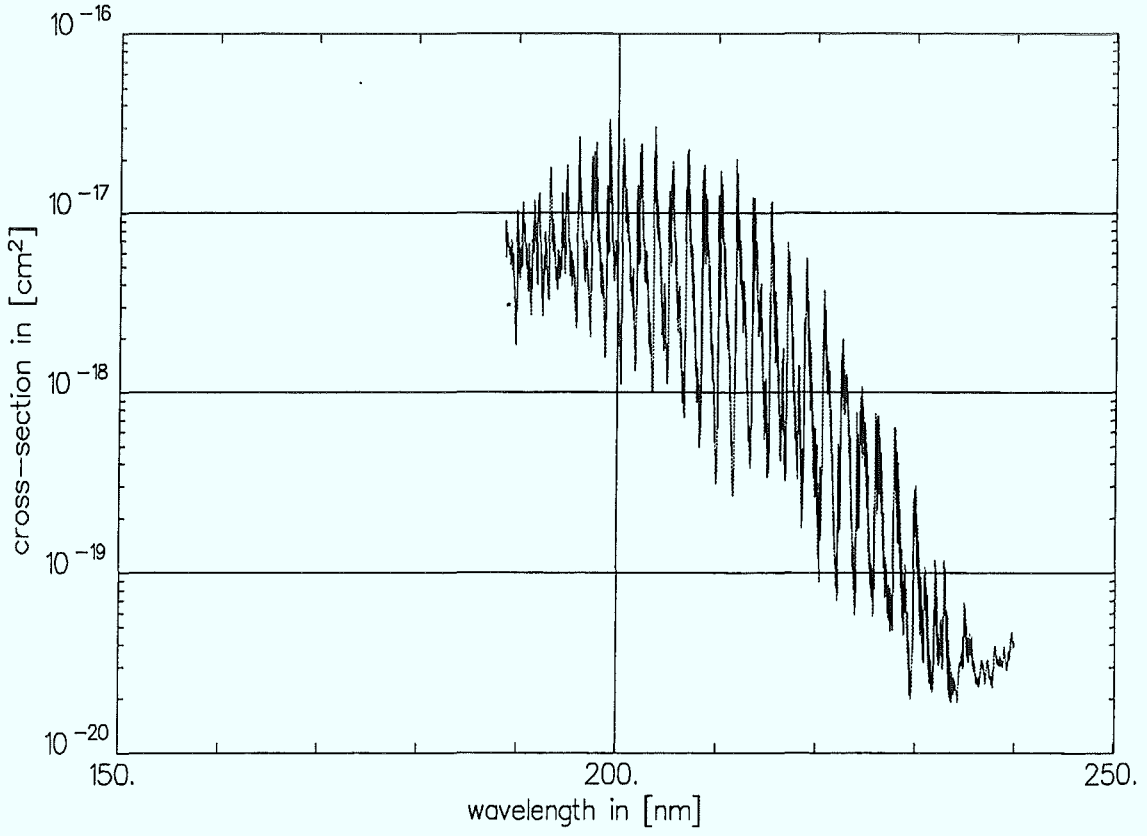
Substance: $SO_2$

Reference:
Freeman, D.E., K. Yoshino, J.R. Esmond, and W.H. Parkinson, High Resolution Cross Section Measurements of $SO_2$ at 213K in the Wavelength Region 172-240 nm, Planet. Space Sci. **32** (1984), 1125-1134

Data: disk Resolution: 0.005 nm

Temperature: 213. K

Temperature dependence: no



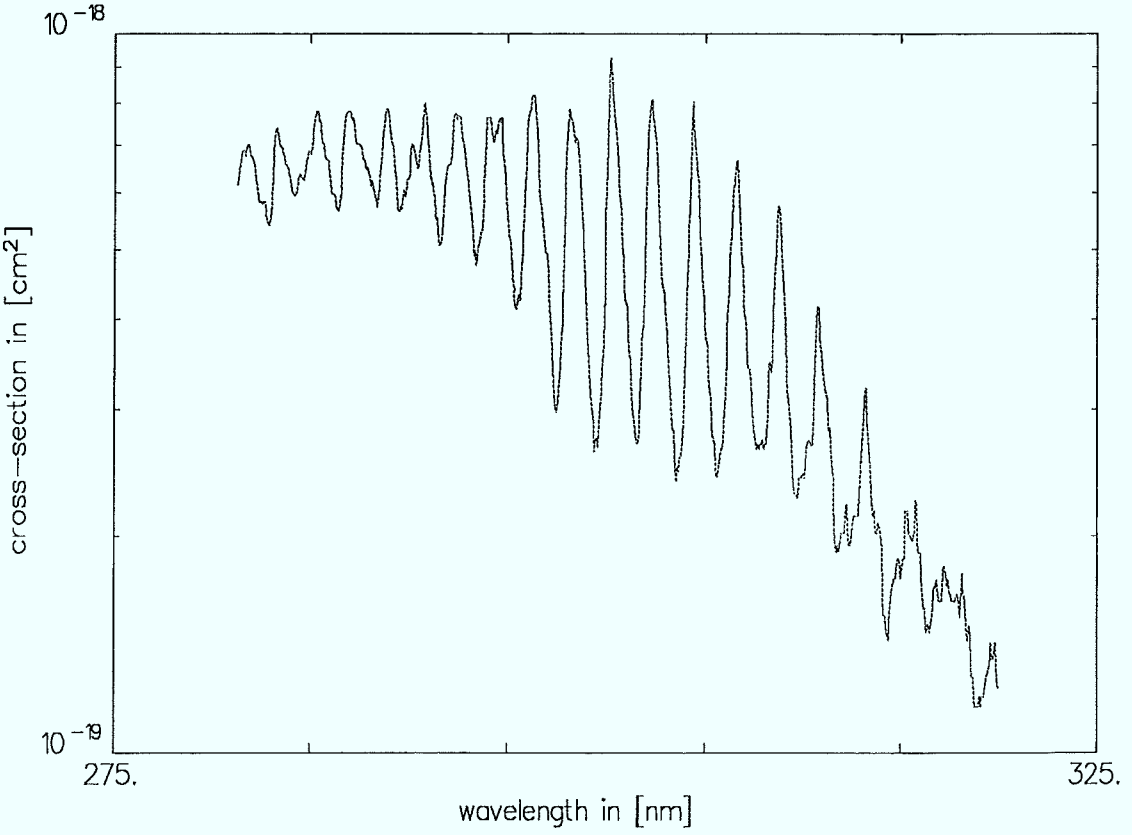
Substance: $SO_2$

Reference:
Weibring, G., Experimentelle Untersuchung und Simulation der $B^1B_1$ <---$X^1A_1$ - Bandenstruktur von $SO_2$ um 308 nm, Diploma-Thesis, University of Göttingen, Germany, 1986

Data: disk Resolution: 0.06 nm

Temperature: 298. K

Temperature dependence: no



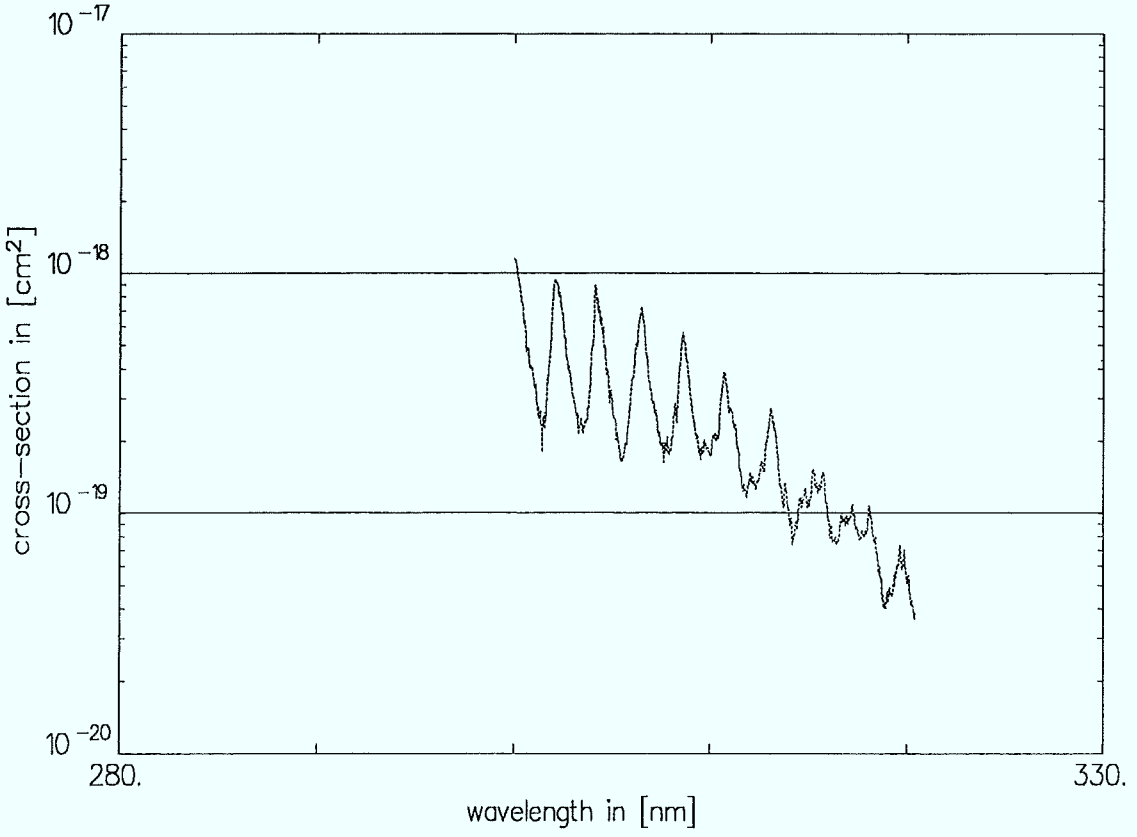
Substance: $SO_2$

Reference:
McGee, T.J., and J. Burris,, $SO_2$ Absorption Cross Sections in the Near U.V., J. Quant. Spec. Radiat. Transfer, **32** (1987), 165-182

Data: table Resolution: 0.03 nm

Temperature: 295. K

Temperature dependence: 295. / 210. K



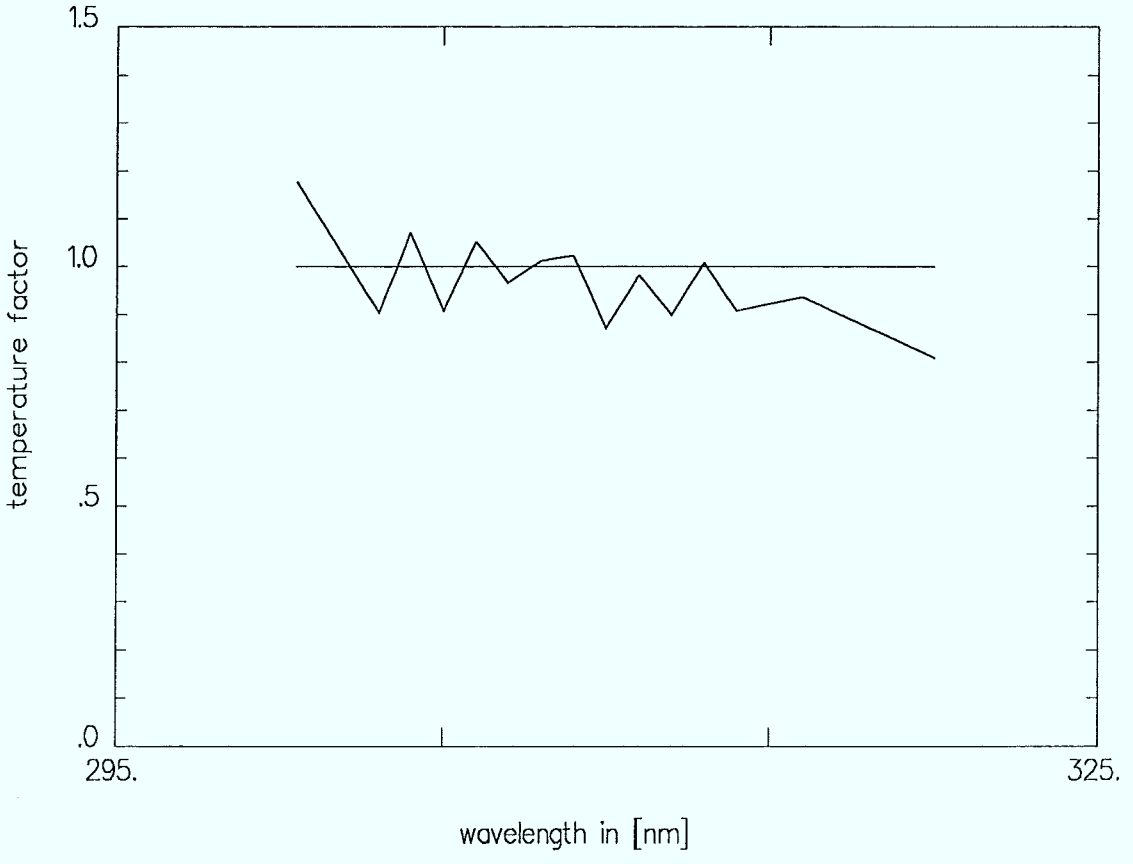
Substance: $SO_2$

Reference:
McGee, T.J., and J. Burris, $SO_2$ Absorption Cross Sections in the Near U.V., J. Quant. Spec. Radiat. Transfer, **32** (1987), 165-182

Temperatures: 295. / 210. K

Function: not fitted

Comment: Temperature dependence from reduced spectra.



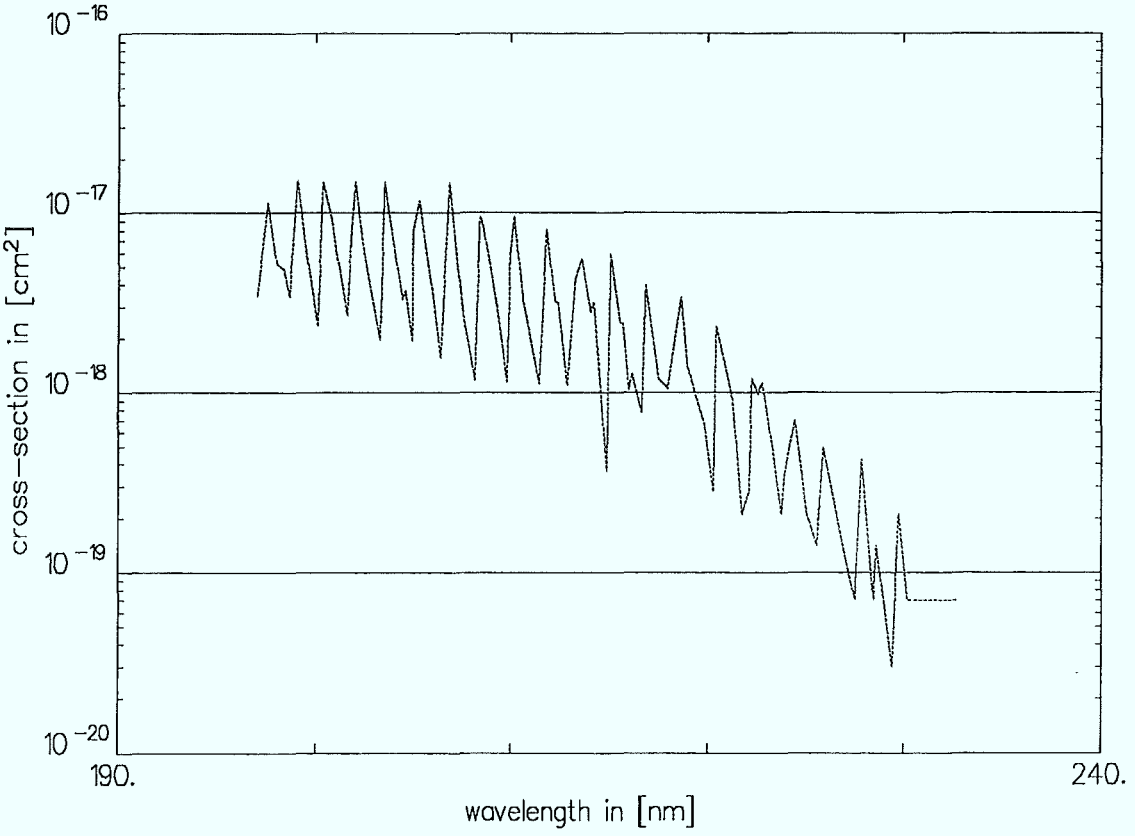
Substance: $SO_2$

Reference:
Martinez, R.D., and J.A. Joens, $SO_2$ Absorption Cross-Section Measurements from 197 nm to 240 nm, Geophys. Res. Lett., **19** (1992), 277-279

Data: diagram

Temperature: 300. K

Temperature dependence: no



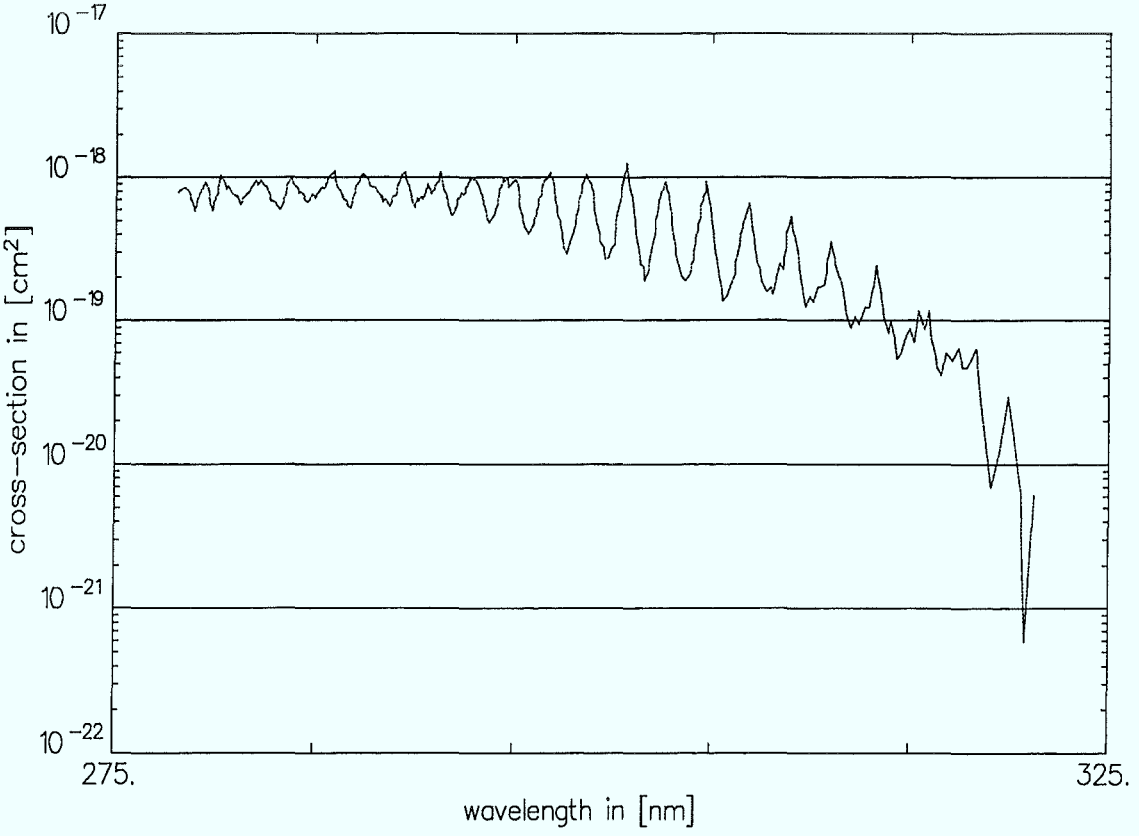
Substance: $SO_2$

Reference:
Vandaele, A.C., P.C. Simon, J.M. Guilmot, M. Carleer, and R. Colin, $SO_2$ Absorption Cross Section Measurements in the UV Using a Fourier Transform Spectrometer, J. Geophys. Res., **99** (1994), 25599-25605

Data: diagram

Temperature: 295. K

Temperature dependence: no



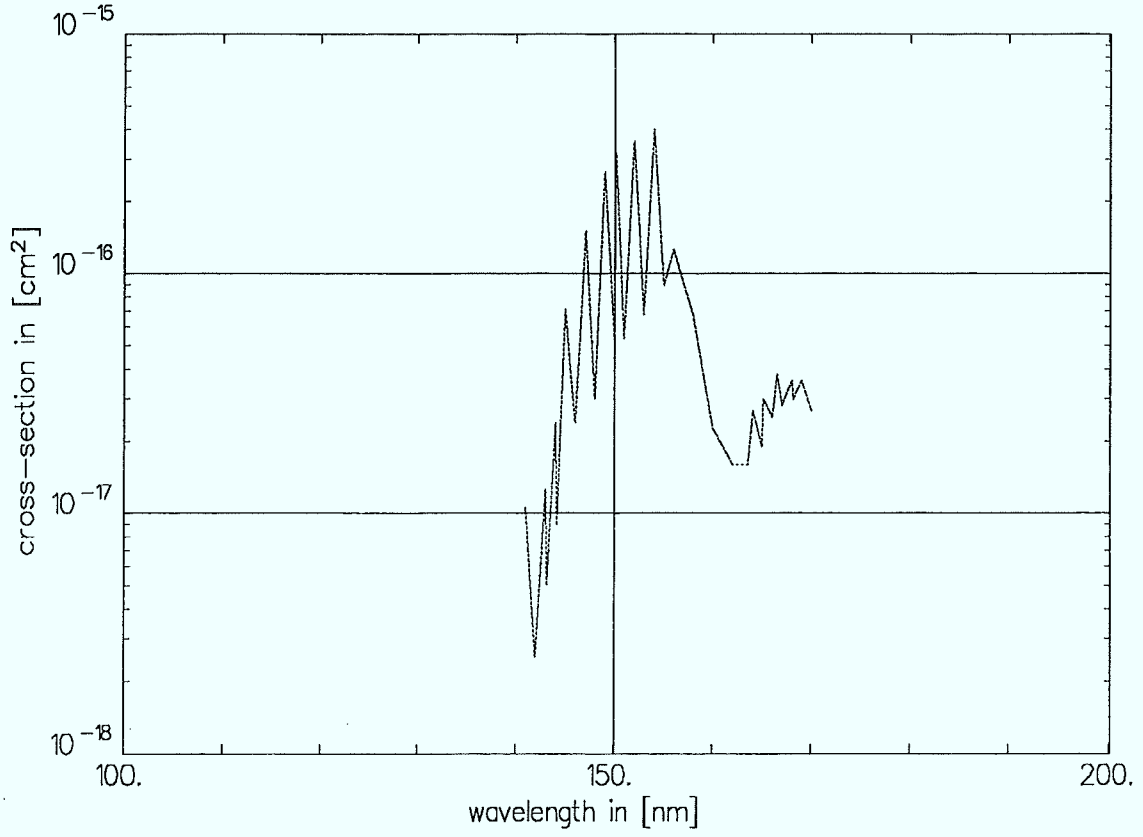
Substance: **COS**

Reference:
Matsunaga, F.M., and K. Watanabe, J. Chem. Phys., **46** (1967), 4457

Data: diagram

Temperature: 273. K

Temperature dependence: no



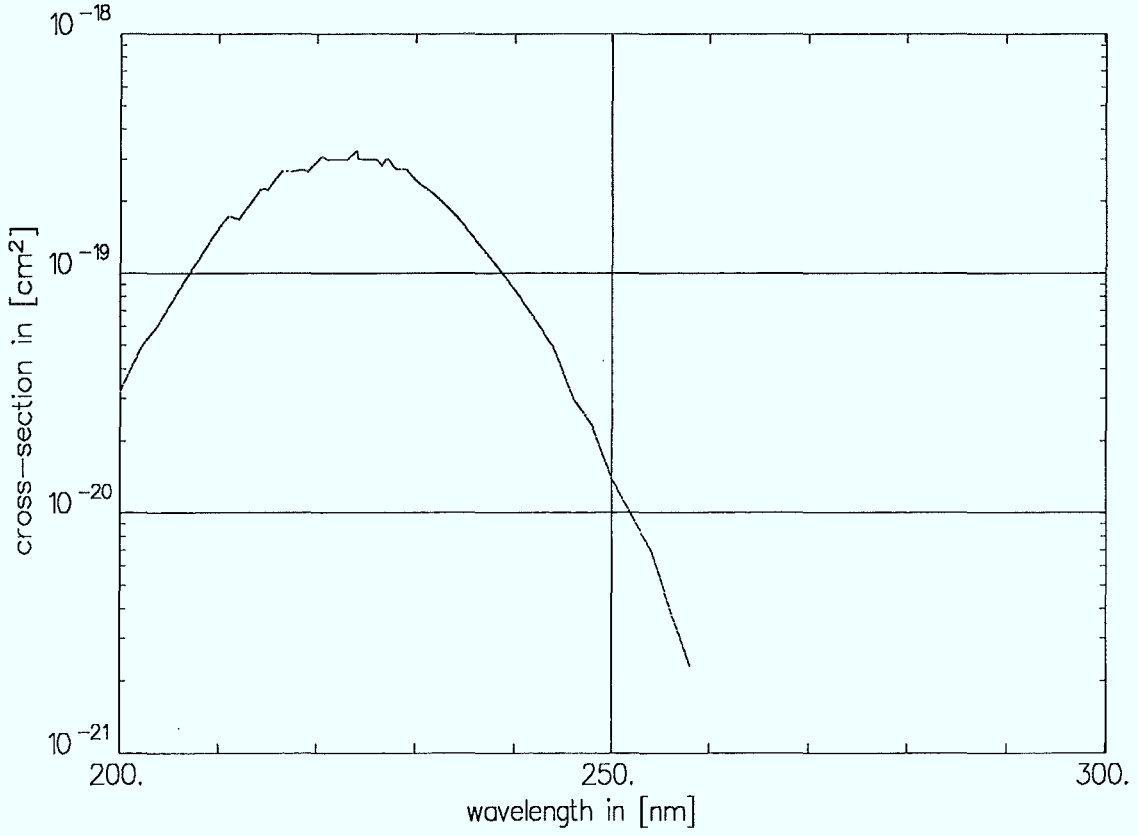
Substance: **COS**

Reference:
Breckenridge, W.M., and H. Taube, Ultraviolet Absorption Spectrum of Carbonyl Sulfide, J. Chem. Phys., **52** (1970), 1713-1715

Data: diagram

Temperature: 298. K

Temperature dependence: no



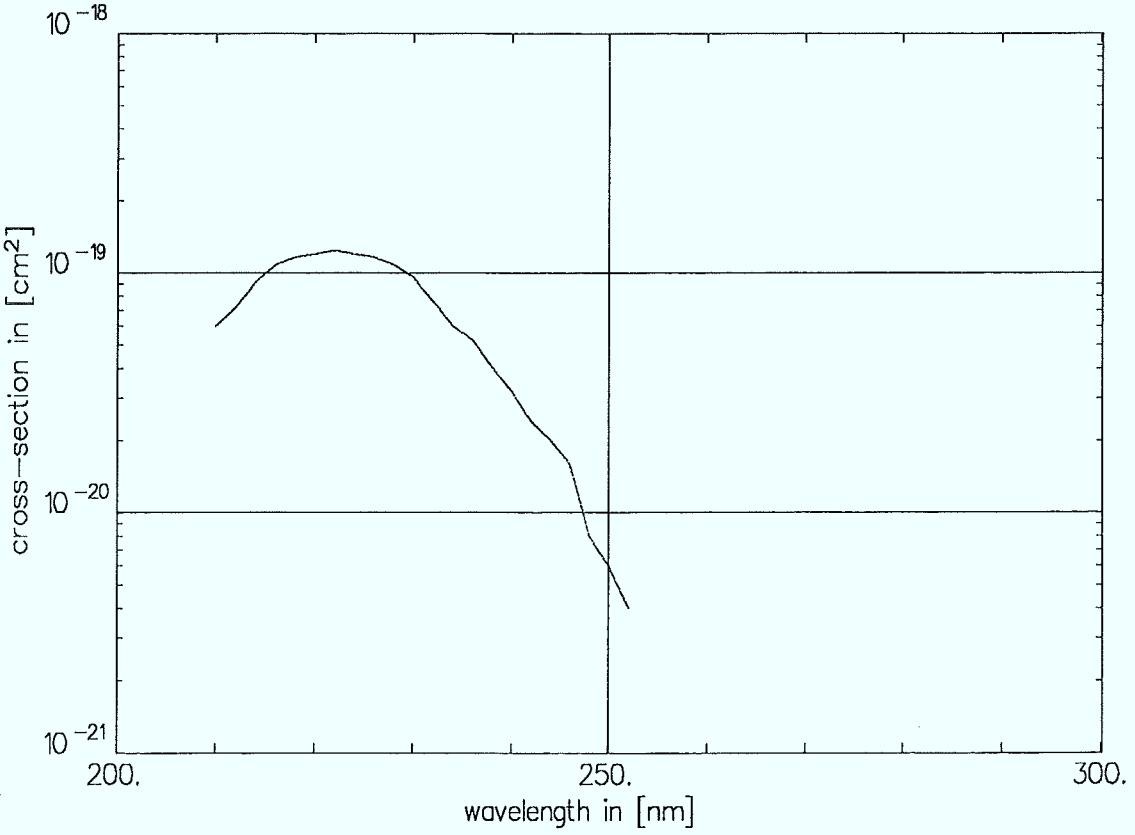
Substance: **COS**

Reference:
Ferro, B.M., and B.G. Reuben, Trans. Faraday Soc., **67** (1971), 2847

Data: diagram

Temperature: 273. K

Temperature dependence: no



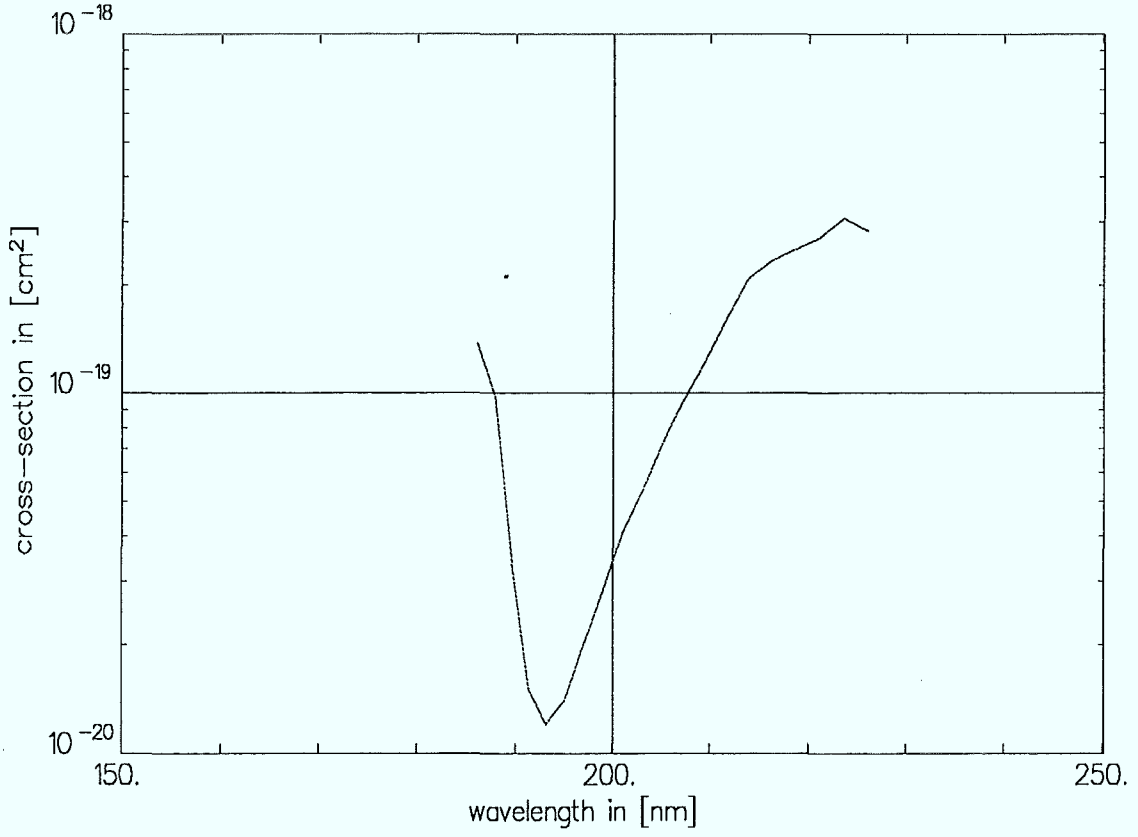
Substance: **COS**

Reference:
NASA Panel for Data Evaluation, Chemical Kinetic and Photochemical Data for Use in Stratospheric Modelling, JPL Publication 79-27 (1979), 84

Data: table Resolution: 1.8 - 2.5 nm

Temperature: 296. K

Temperature dependence: 296. / 251. / 232. K



Substance: **COS**

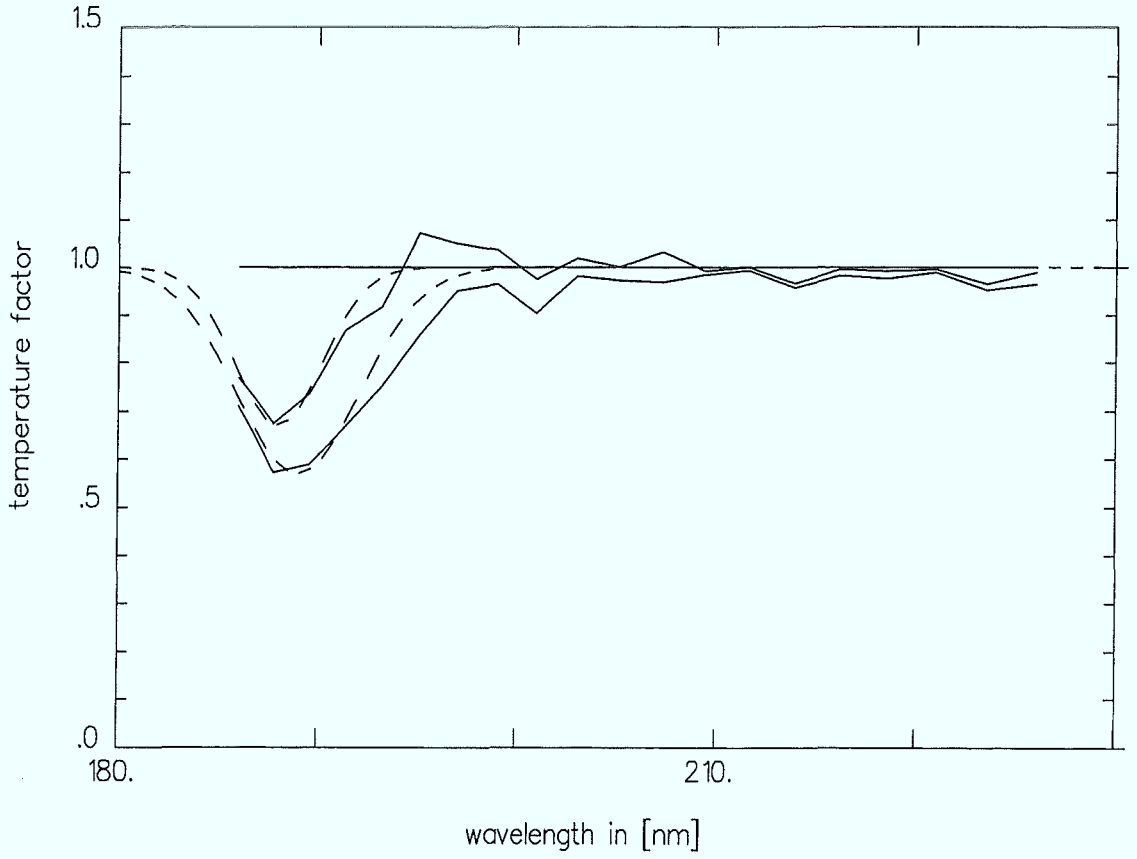
Reference:
NASA Panel for Data Evaluation, Chemical Kinetic and Photochemical Data for Use in Stratospheric Modelling, JPL Publication 79-27 (1979), 84

Temperatures: 296. / 251. / 232. K

Function: 2

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 8.789E-3 | b = | -3.235E-5 | c = | 0.56 |
| d = | -2.63E-3 | e = | 201.2 | f = | -5.26E-2 |



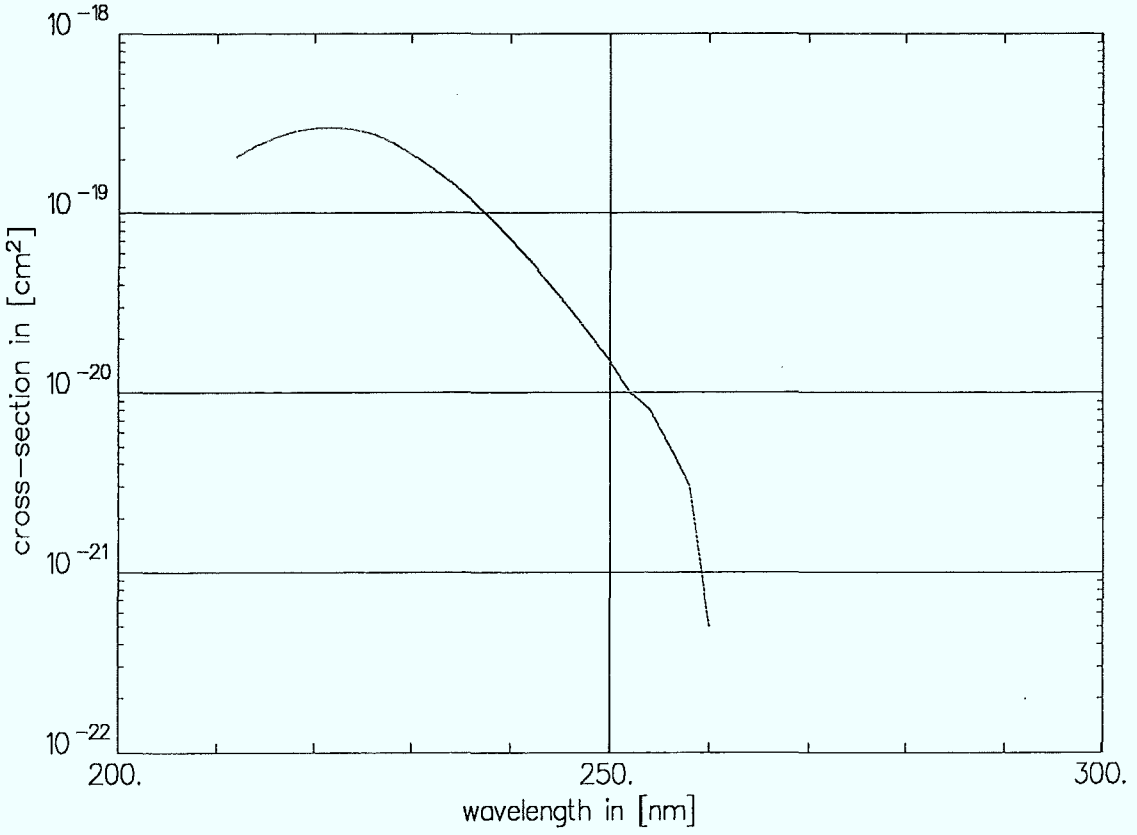
Substance: **COS**

Reference:
Leroy, B., G. Le Bras, and P. Rigaud, Spectres d'absorption dans l'ultraviolet de composés soufrés d'intérêt aéronomique, Ann. Géophys., **37** (1981), 297-302.

Data: table Resolution: 2.0 nm

Temperature: 294. K

Temperature dependence: no



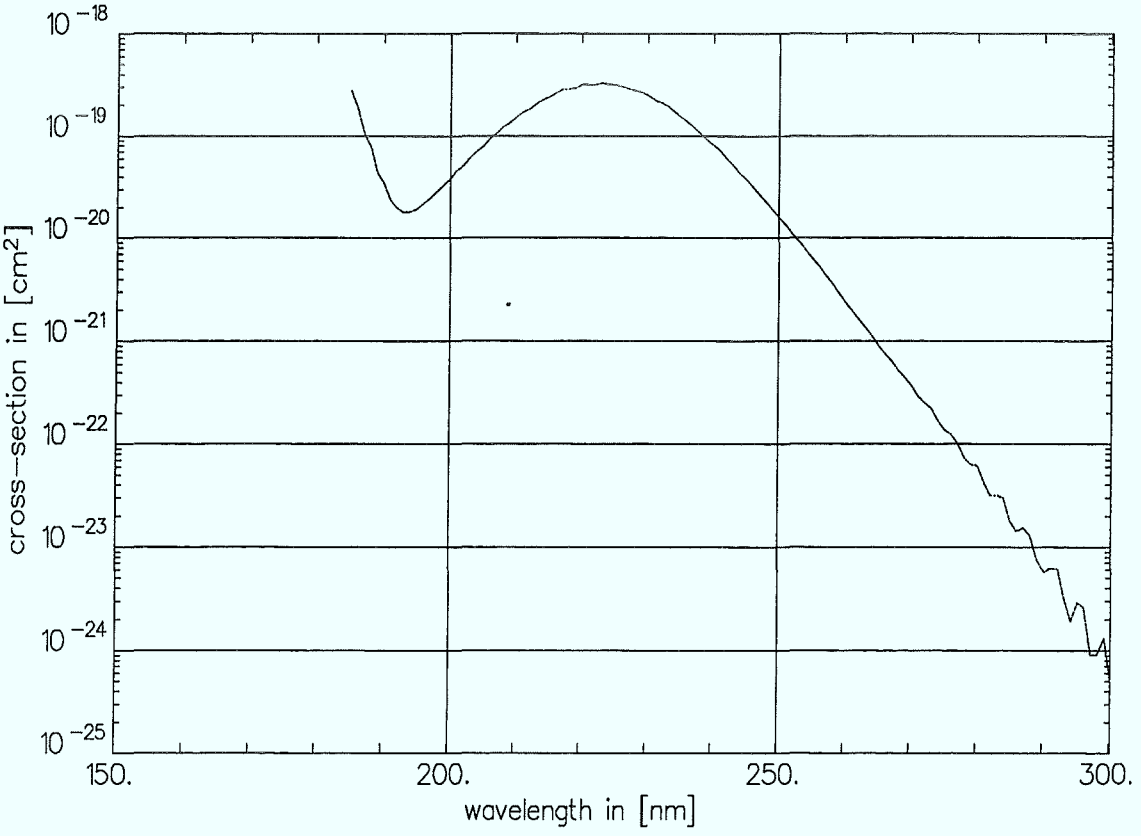
Substance: **COS**

Reference:
Molina, L.T., J.J. Lamb, and M.J. Molina, Temperature Dependent UV Absorption Cross Sections for Carbonyl Sulfide, Geophys. Res. Lett., **8** (1981), 1008-1011

Data: table Resolution: 1.0 nm

Temperature: 295. K

Temperature dependence: 295. / 225. K



Substance: **COS**

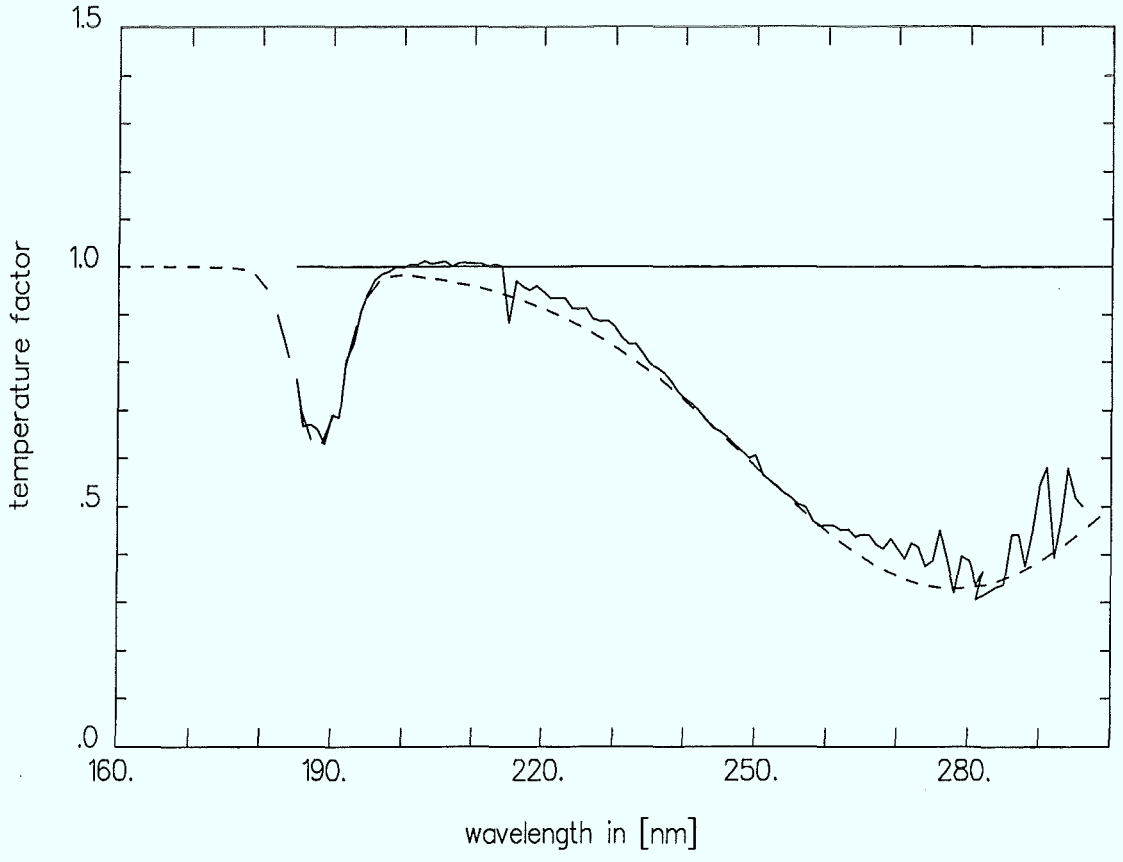
Reference:
Molina, L.T., J.J. Lamb, and M.J. Molina, Temperature Dependent UV Absorption Cross Sections for Carbonyl Sulfide, Geophys. Res. Lett., **8** (1981), 1008-1011

Temperatures: 295. / 225. K

Function: 3

Fit Parameter:

| | | | | | |
|---|---|---|---|---|---|
| a = | 5.286E-3 | b = | -4.E-2 | $\lambda_1$ = | 188. |
| c = | 9.58E-3 | d = | -6.E-4 | $\lambda_2$ = | 278. |



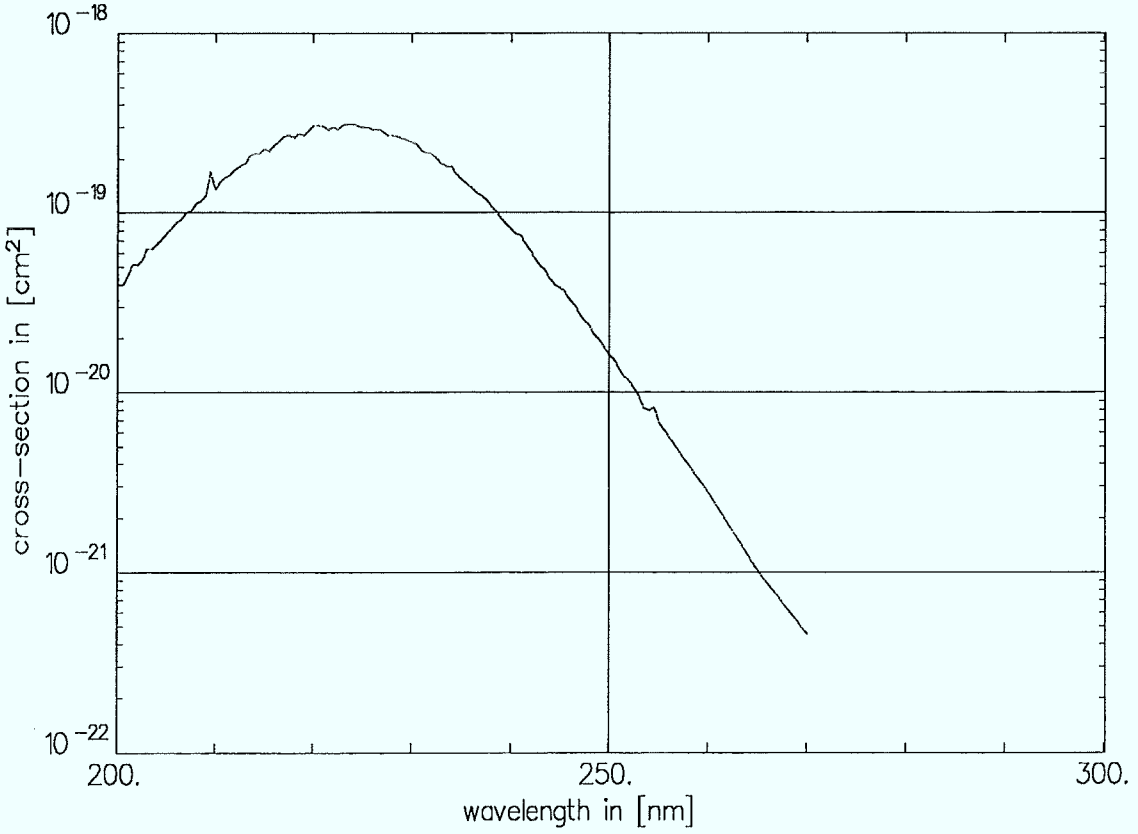
Substance: **COS**

Reference:
Rudolph, R.N., and E.C.Y. Inn, OCS Photolysis and Absorption in the 200- to 300-nm Region, J. Geophys. Res., **86** (1981), 9891-9894.

Data: table Resolution: 0.5 nm

Temperature: 297. K

Temperature dependence: no



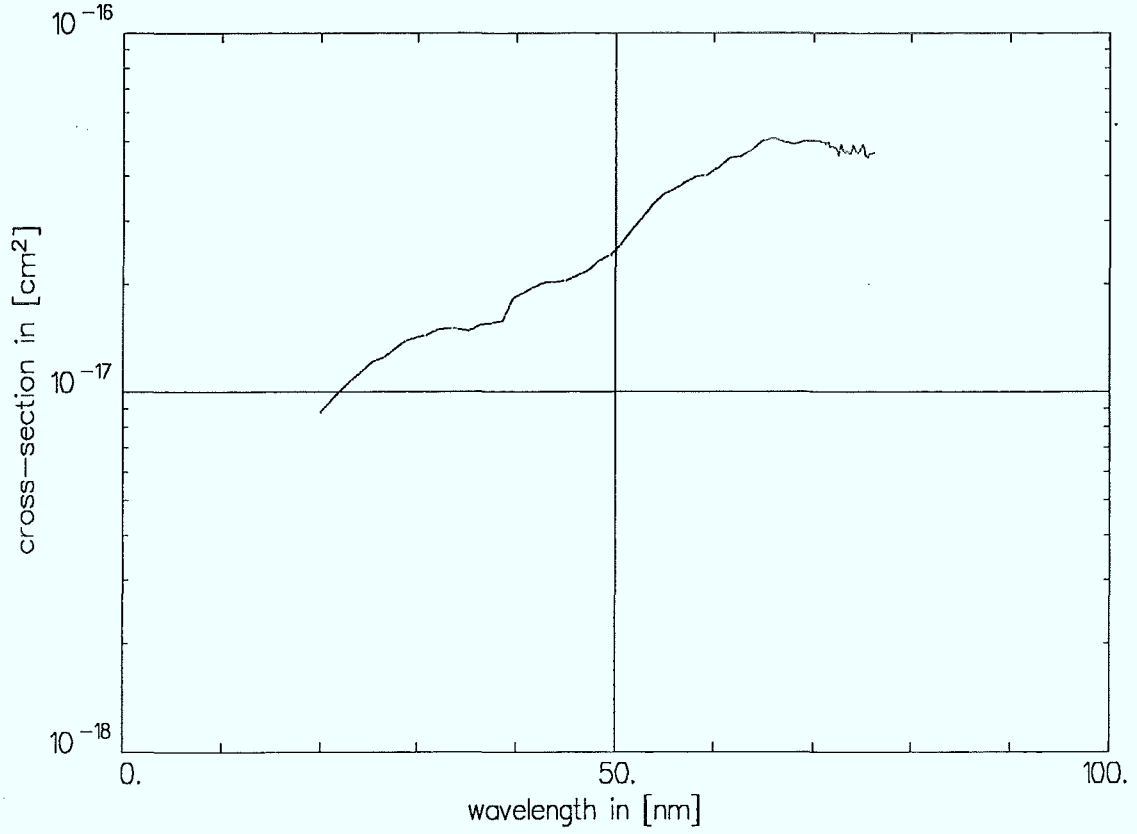
Substance: **COS**

Reference:
Wu, C.Y.R., and D.L. Judge, Photoabsorption Cross Section of COS, J. Chem. Phys., **76** (1982), 2871-2874

Data: diagram

Temperature: 298. K

Temperature dependence: no



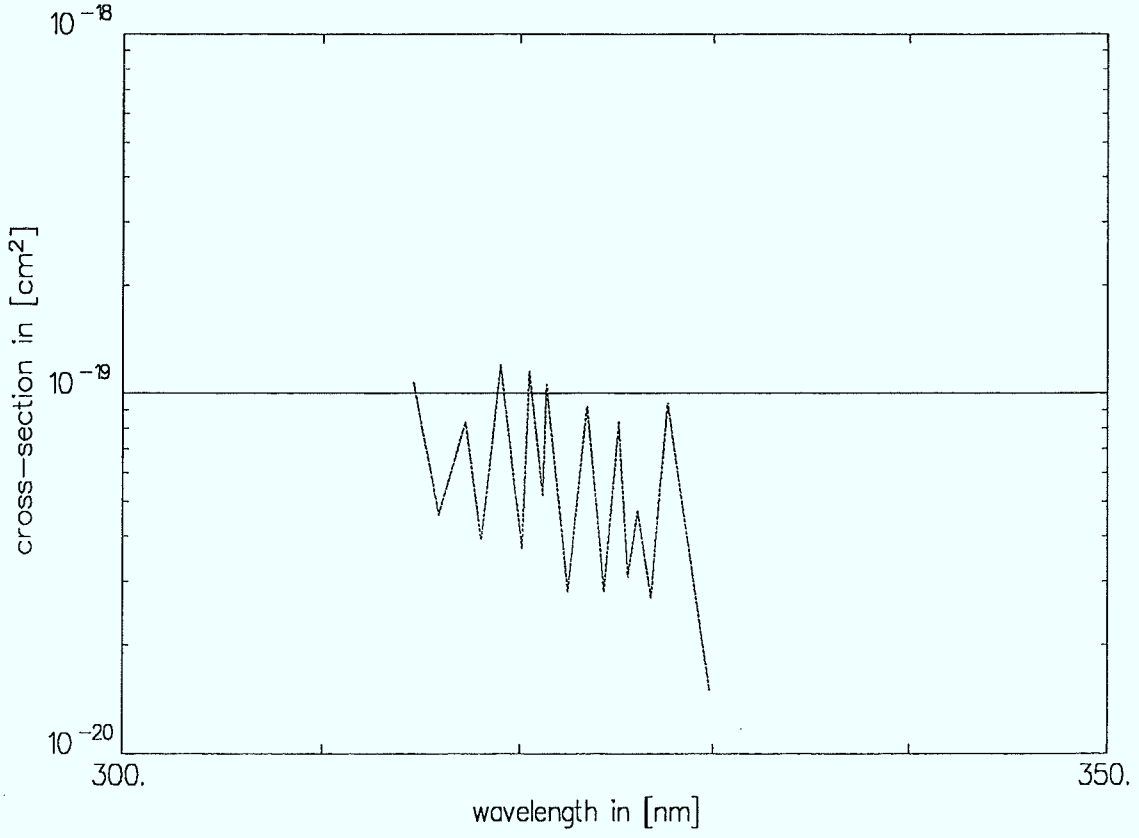
Substance: $CS_2$

Reference:
Leroy, B., G. Le Bras, and P. Rigaud, Spectres d'absorption dans l'ultraviolet de composés soufrés d'intérêt aéronomique, Ann. Géophys., **37** (1981), 297-302.

Data: table Resolution: 2.0 nm

Temperature: 294. K

Temperature dependence: no



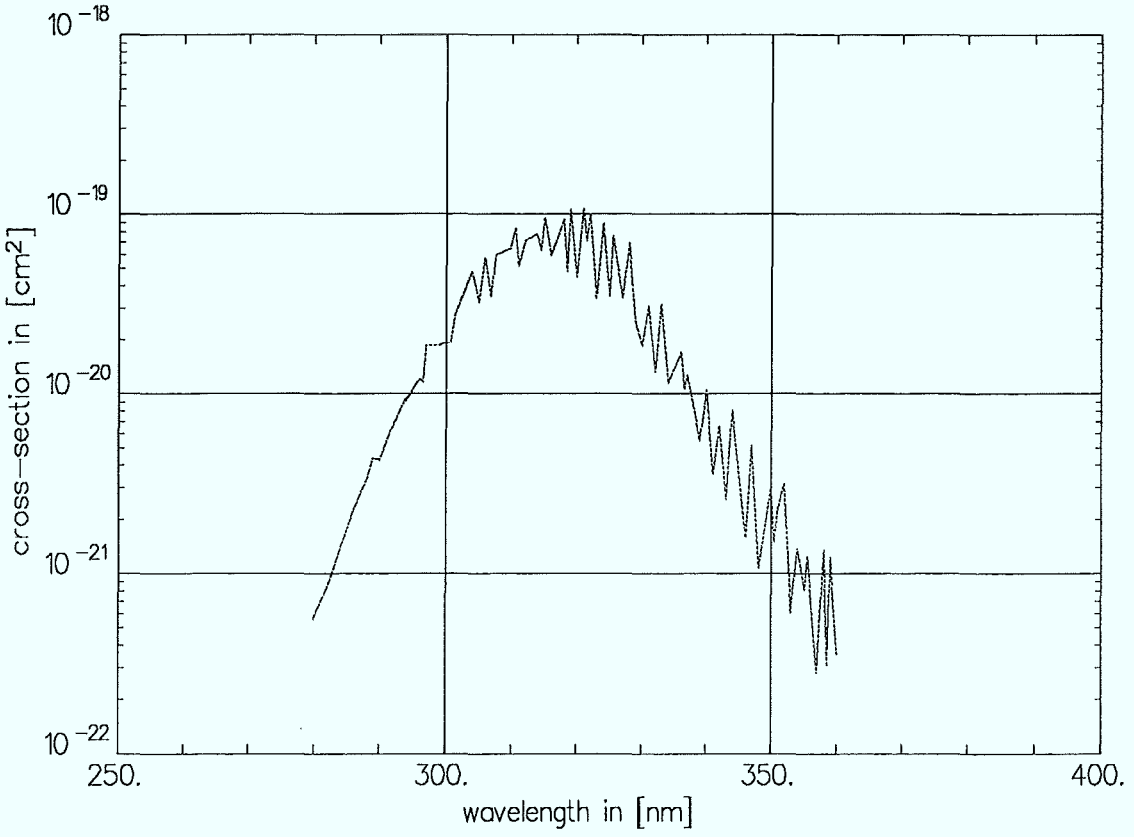
Substance: $CS_2$

Reference:
Wine, P.H., W.L. Chameides, and A.R. Ravishankara, Potential Role of $CS_2$ Photooxidation in Tropospheric Sulfur Chemistry, Geophys. Res. Lett., **8** (1981), 543-546

Data: diagram

Temperature: 298. K

Temperature dependence: no



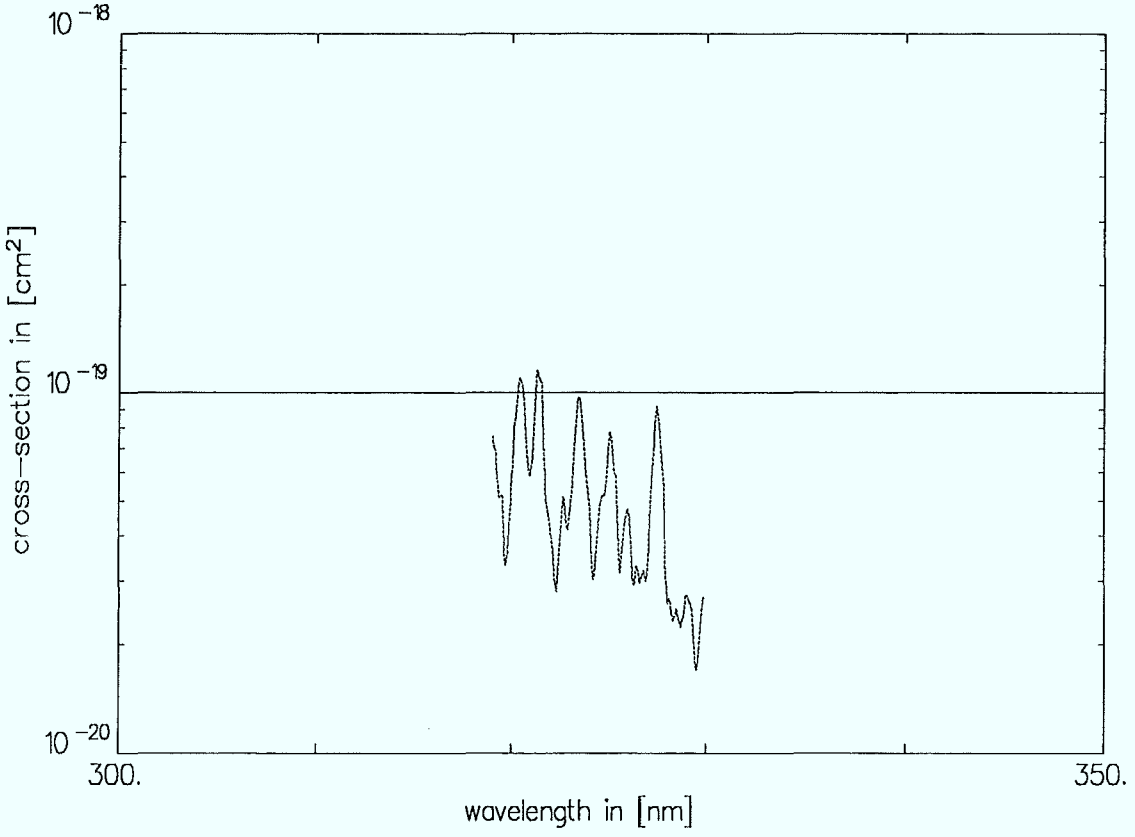
Substance: $CS_2$

Reference:
Wu, C.Y.R., and D.L. Judge, $SO_2$ and $CS_2$ Cross Section Data in the Ultraviolet Region, Geophys. Res. Lett., **8** (1981), 769-771

Data: diagram

Temperature: 294. K

Temperature dependence: no



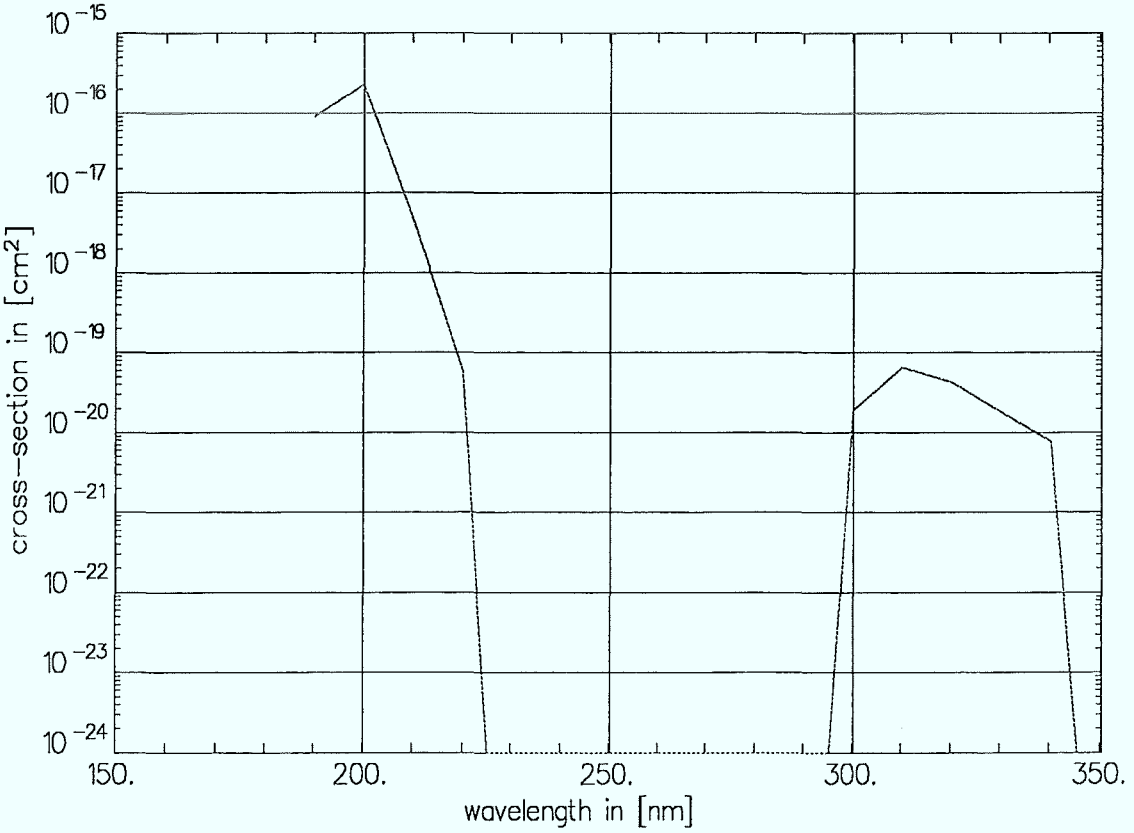
Substance: $CS_2$

Reference:
Dove, J.E., H. Hippler, J. Plach, and J. Troe, Ultraviolet Spectra of Vibrationally Excited $CS_2$ Molecules, J. Chem. Phys., **81** (1984), 1209-1214

Data: table Resolution: 10.0 - 20.0 nm

Temperature: 300. K

Temperature dependence: no



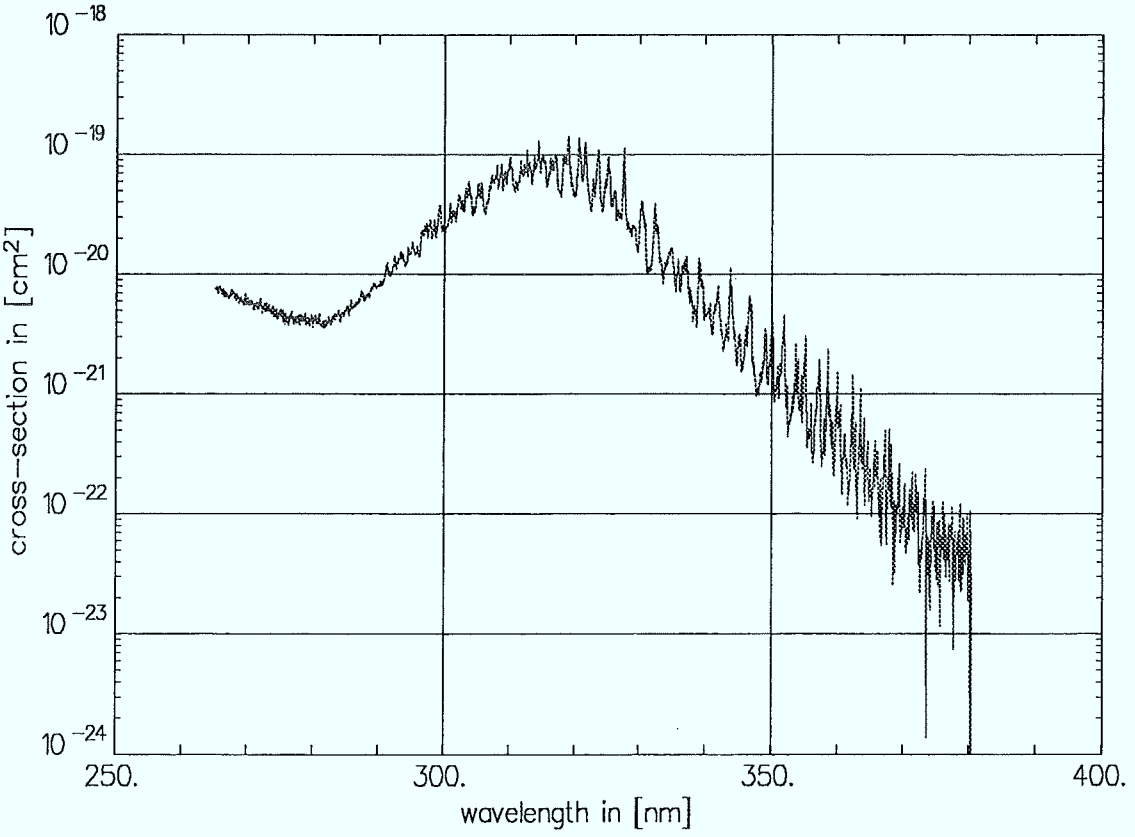
Substance: $CS_2$

Reference:
W. Schneider, and G.K. Moortgat, priv. comm., MPI Mainz, 1990

Data: disk Resolution: 0.05 nm

Temperature: 294. K

Temperature dependence: no



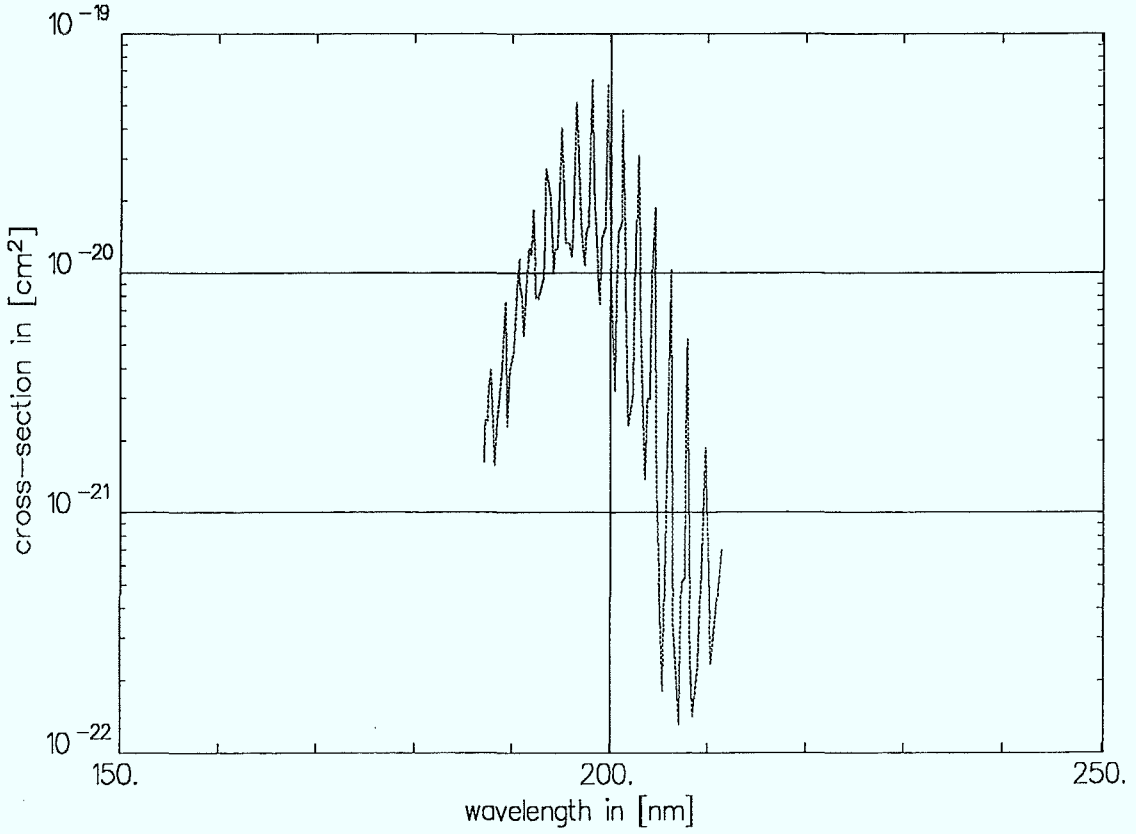
Substance: $CS_2$

Reference:
Xu, H. and J.A. Joens, $CS_2$ Absorption Cross-Section Measurements from 187 nm to 230 nm, Geophys. Res. Lett., **20** (1993), 1035-1037.

Data: diagram

Temperature: 300. K

Temperature dependence: no



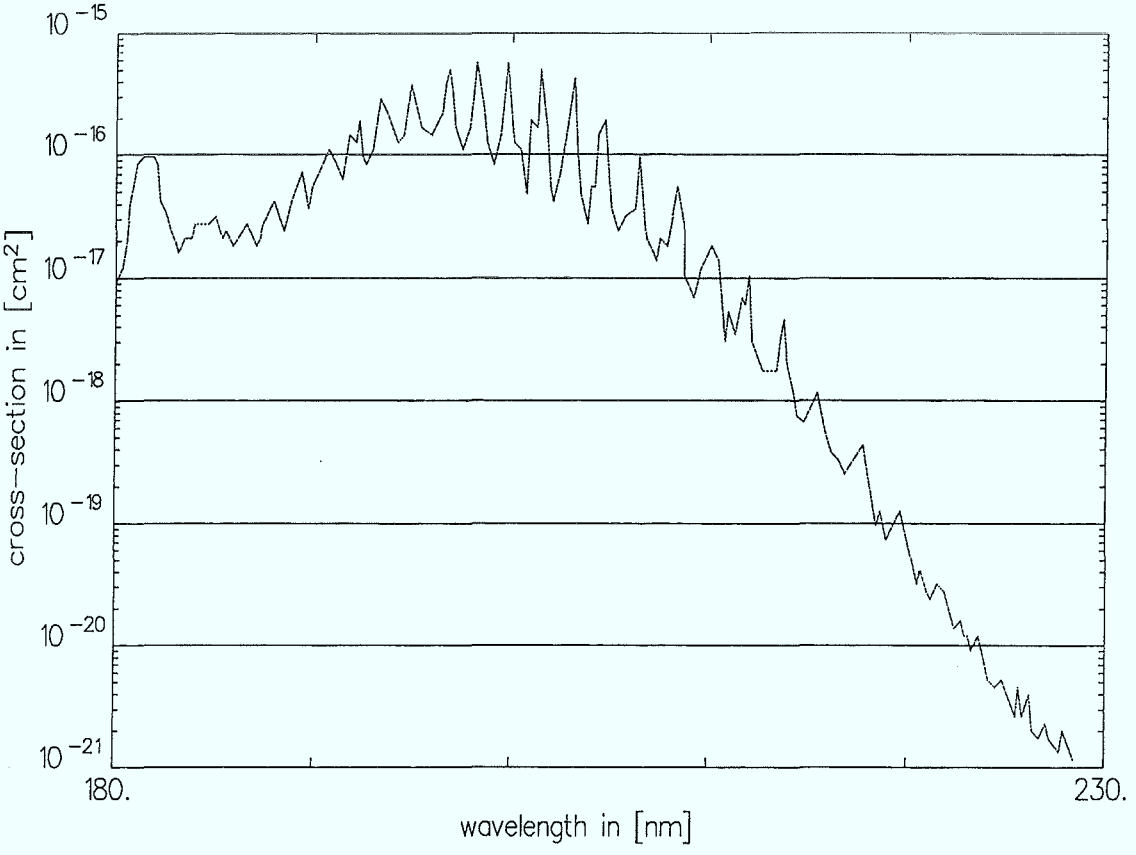
Substance: $CS_2$

Reference:
Chen, F.Z., and C.Y.R. Wu, High, Room and Low Temperature Photoabsorption Cross Sections of $CS_2$ in the 1800-2300 A Region, Geophys. Res. Lett., **22** (1995), 2131-2134.

Data: diagram

Temperature: 295. K

Temperature dependence: 295. / 203. K



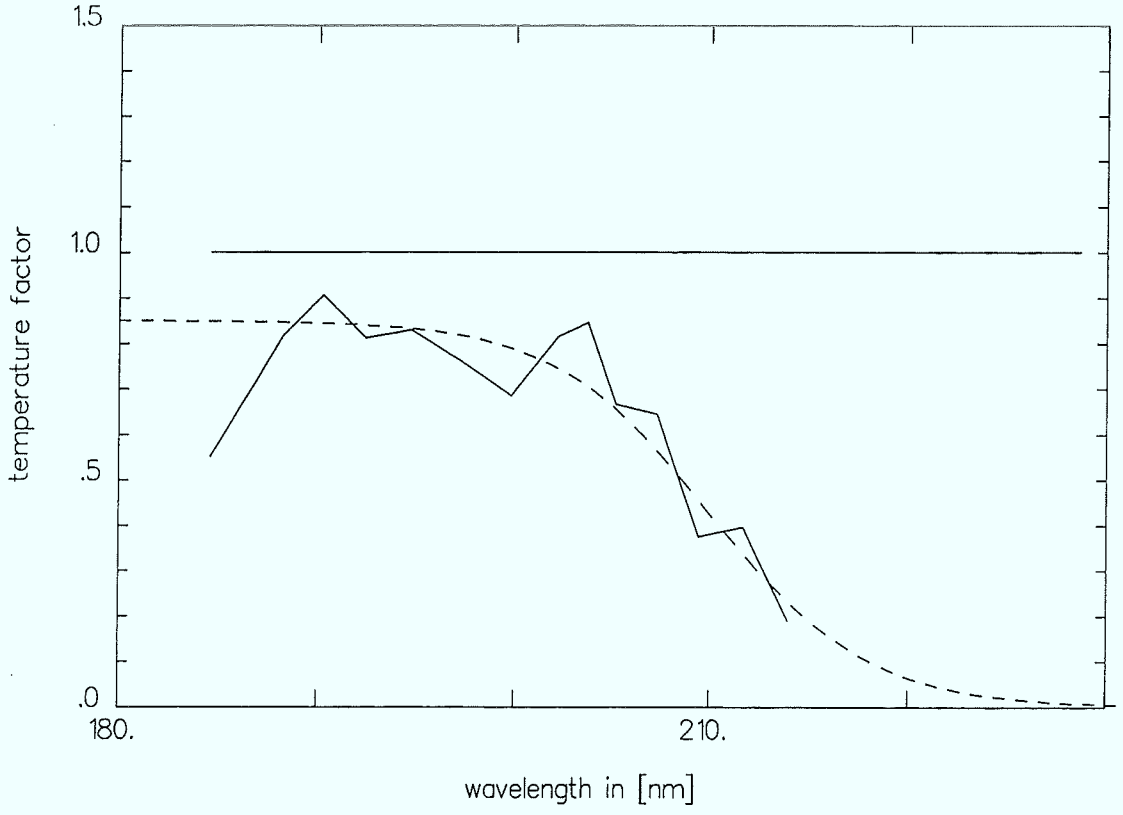
Substance: $CS_2$

Reference:
Chen, F.Z., and C.Y.R. Wu, High, Room and Low Temperature Photoabsorption Cross Sections of $CS_2$ in the 1800-2300 A Region, Geophys. Res. Lett., **22** (1995), 2131-2134.

Temperatures: 295. / 203. K

Function: 5

| Fit Parameter: | a = | 2.0 | b = | -2.09E-3 | c = | 0.25 |
|---|---|---|---|---|---|---|
| | d = | 0 | e = | 210. | f = | 0. |



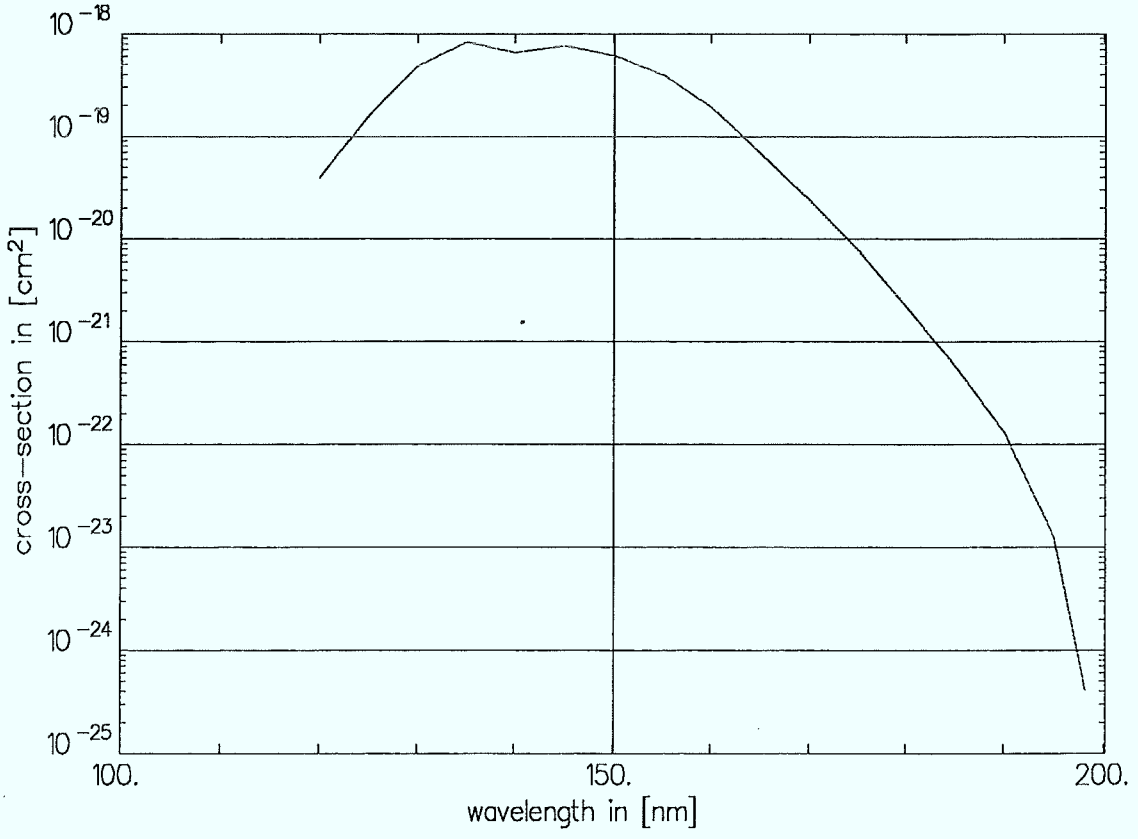
Substance: $CO_2$

Reference:
Thompson, B.A., P. Harteck, and R.R. Reever Jr., Ultraviolet Absorption Coefficients of $CO_2$, CO, $H_2O$, $N_2O$, $NH_3$, NO, $SO_2$, and $CH_4$ between 1850 and 4000 A, J. Geophys. Res., **68** (1963), 6431-6436

Data: diagram

Temperature: 298. K

Temperature dependence: no



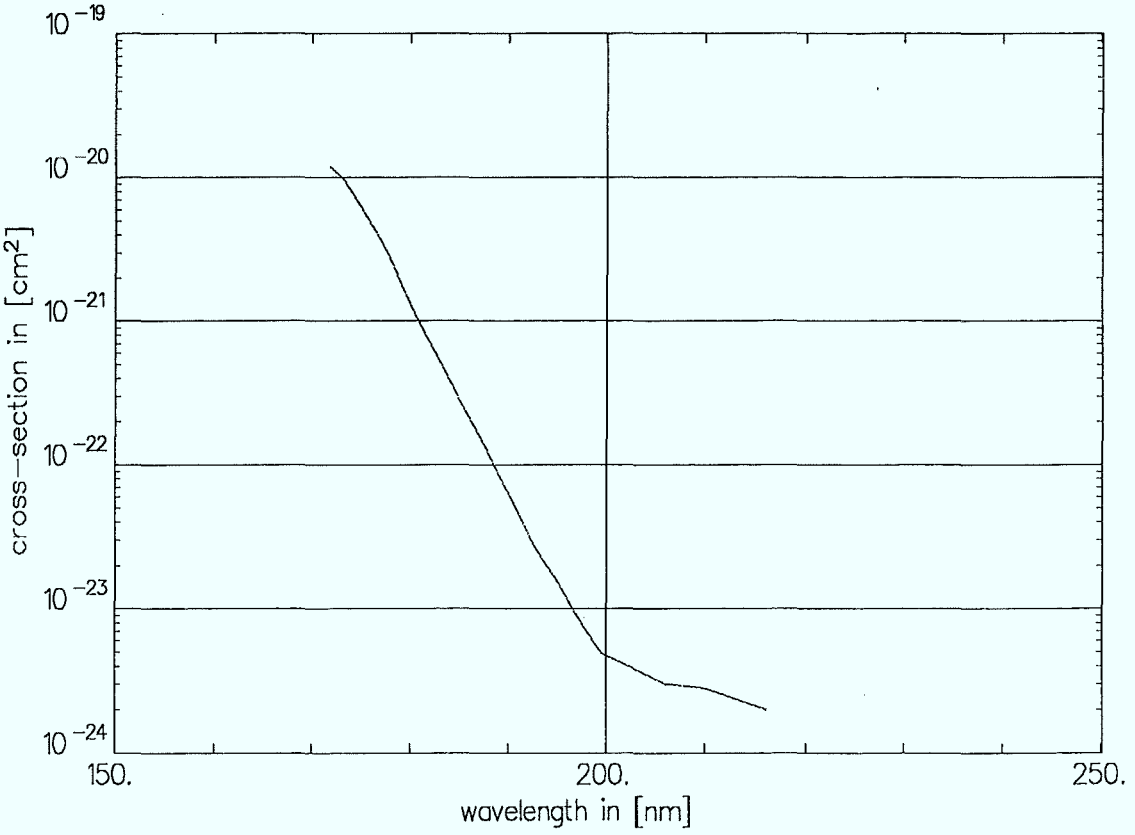
Substance: $CO_2$

Reference:
Ogawa, M., Absorption Cross Sections of $O_2$ and $CO_2$ Continua in the Schumann and Far-UV Regions, J. Chem. Phys. **54** (1971), 2550-2556

Data: table Resolution: 1.5 - 6.5 nm

Temperature: 298. K

Temperature dependence: no



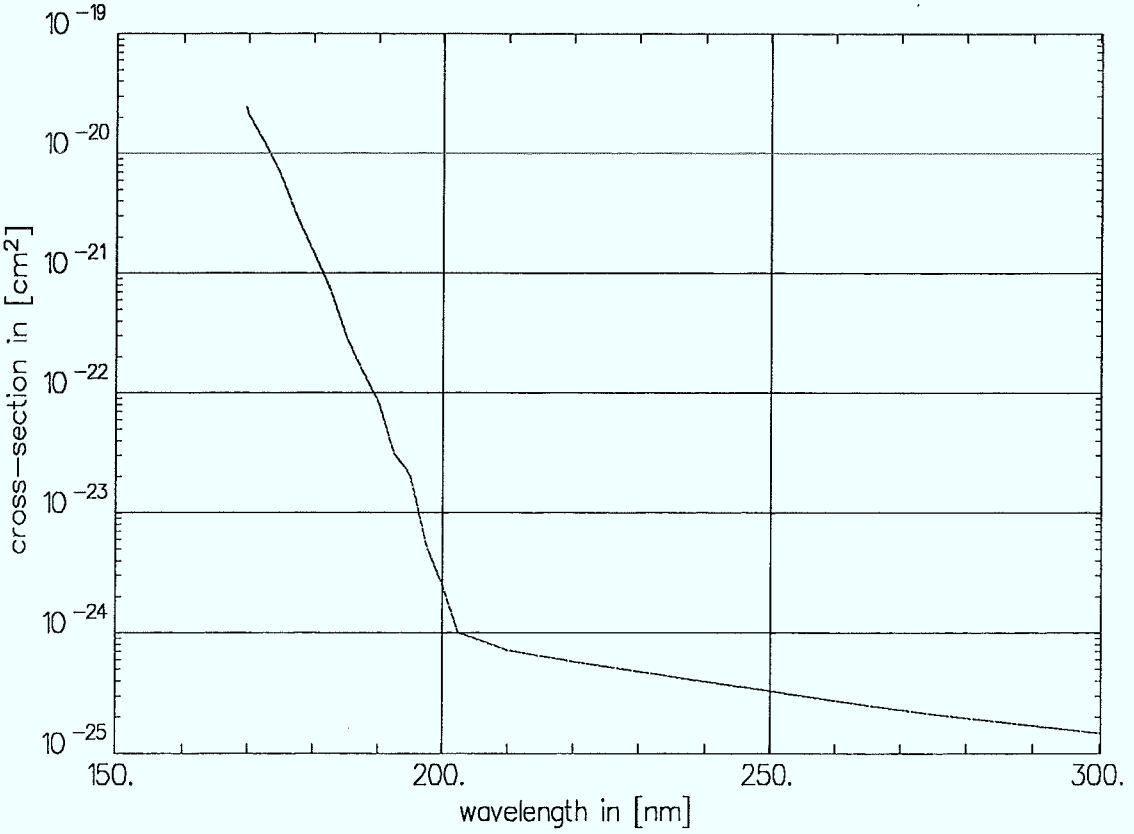
Substance: $CO_2$

Reference:
Shemansky, D.E., $CO_2$ Extinction Coefficients 1700-3000 A, J. Chem. Phys., **56** (1972), 1582-1587

Data: table Resolution: 0.4 - 5.0 nm

Temperature: 298. K

Temperature dependence: no



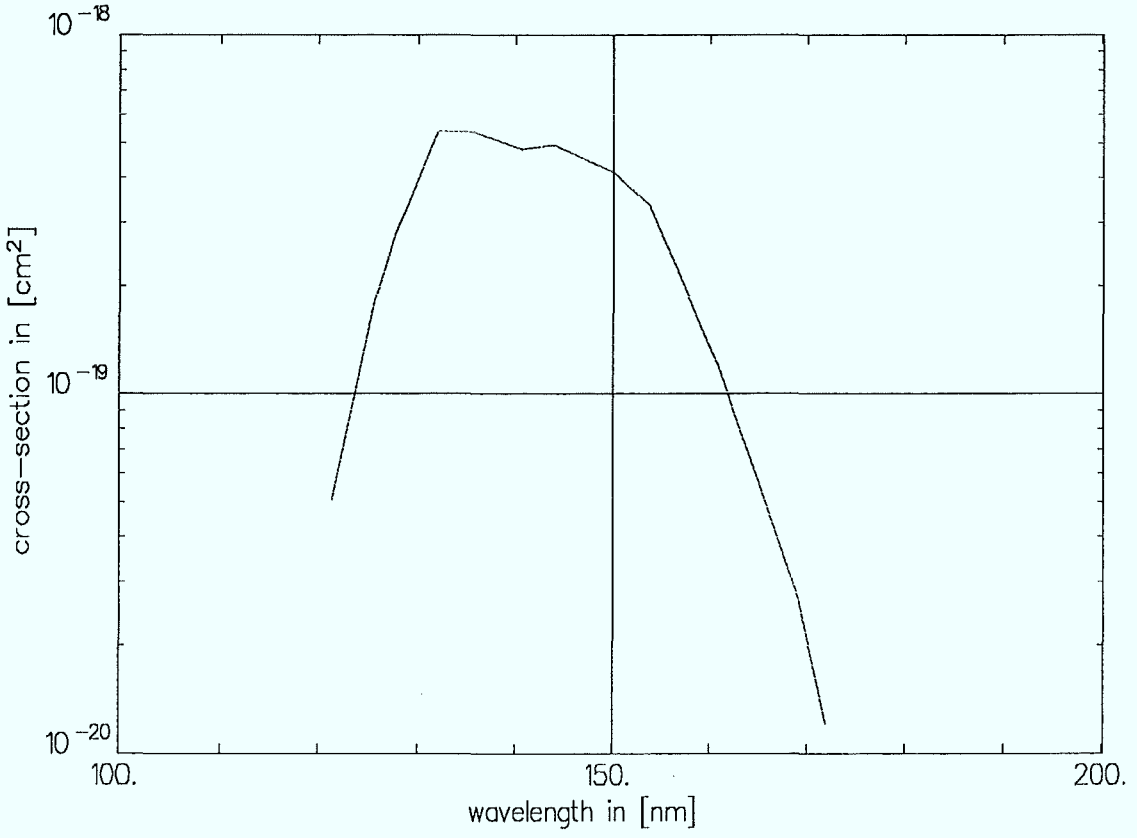
Substance: $CO_2$

Reference:
Yoshino, K., J.R. Esmond, W.H. Parkinson, K. Ito, and T. Matsui, Absorption Cross Section Measurements of Carbon Dioxide in the Wavelength Region 118.7 nm - 175.5 nm and the Temperature Dependence, submitted to J. Geophys. Res., November 22, 1994

Data: table Resolution: 2.05 - 8.19 nm

Temperature: 295. K

Temperature dependence: 295. / 195. K



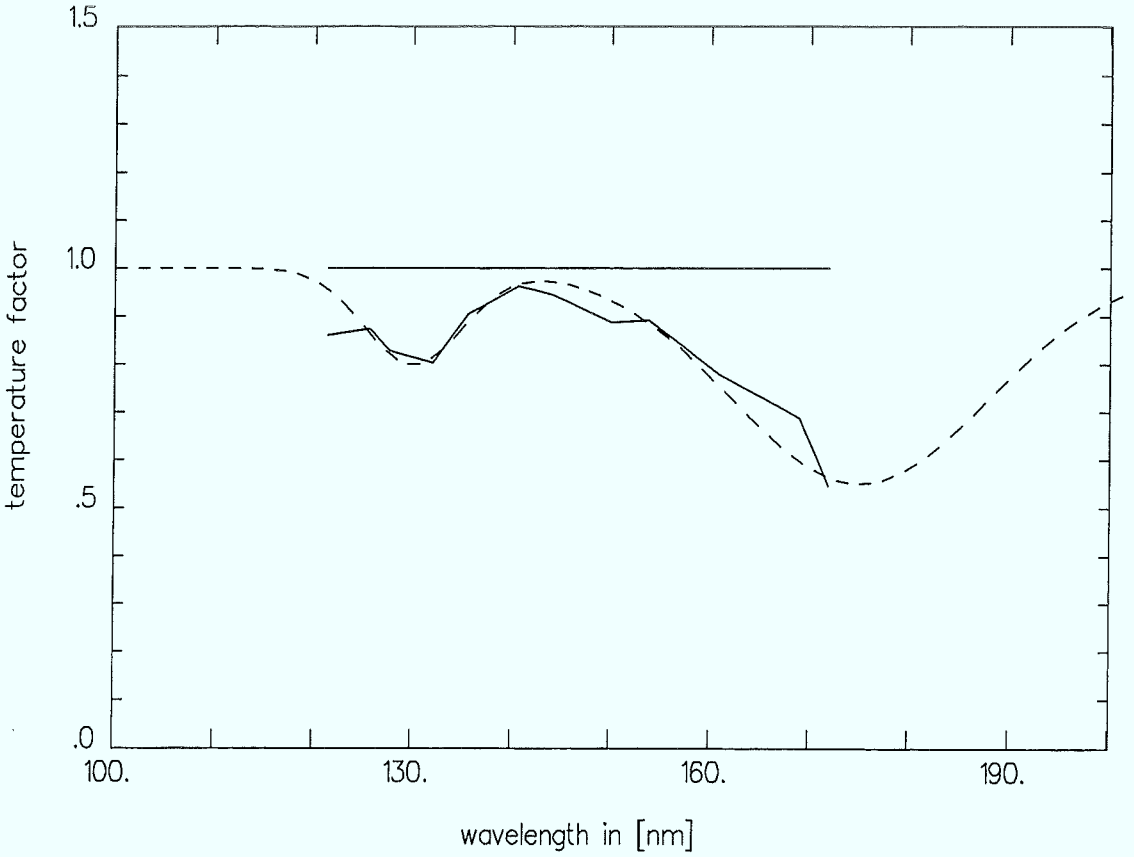
Substance: $CO_2$

Reference:
Yoshino, K., J.R. Esmond, W.H. Parkinson, K. Ito, and T. Matsui, Absorption Cross Section Measurements of Carbon Dioxide in the Wavelength Region 118.7 nm - 175.5 nm and the Temperature Dependence, submitted to J. Geophys. Res., November 22, 1994

Temperatures: 295. / 195. K

Function: 3

| Fit Parameter: | a = | 0.2 | b = | -2.E-3 | c = | 130. |
|---|---|---|---|---|---|---|
| | d = | 0.45 | e = | -3.E-3 | f = | 175. |



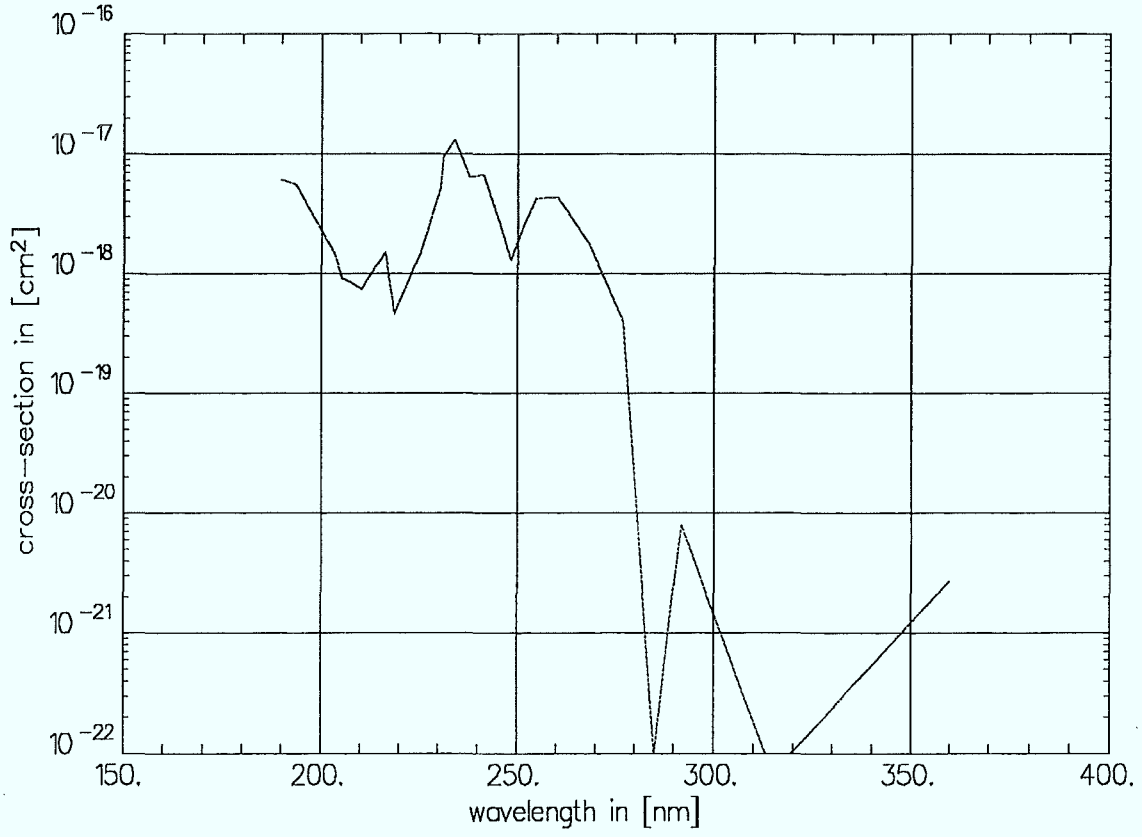
Substance: **NaCl(g)**

Reference:
Silver, J.A., D.R. Wornsop, A. Freedman, and C.E. Colb, Absolute Photodissociation Cross Sections of Gas Phase Sodium Chloride at Room Temperature, J. Chem. Phys., **84** (1986), 4378-4384

Data: table Resolution: 3.7 - 68.0 nm

Temperature: 300. K

Temperature dependence: no



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