

Reference cross-sections for the OMI Data product

Introduction

Due to the fact that DOAS retrieval is extremely sensitive to spectral structures that resemble absorption structures of the trace gas of interest, the following requirement is defined in the OMI Science Requirements Document:

SR 5.2.2.8 The effect of spectral structures similar to absorption structures caused by the instrument and/or its calibration in the reflectivity spectra shall be less than 10^{-4} at all wavelengths and swath angles.

The figures in this Annex show the relevant absorption structures for the OMI-instrument in the retrieval windows as specified in the Table 4.1 of the SRD.

References

For O₃, NO₂, BrO, SO₂, as used in the MODTRAN 4.1 model:

Berk, A., L.S. Bernstein, and D.C. Robertson, *MODTRAN: A Moderate Resolution Model for LOWTRAN 7*, GL-TR-89-0122, Geophysics Directorate, Phillips Laboratory, Hanscom AFB, MA 01731 (April 1989) ADA214337.

For HCHO, see:

C.A. Cantrell, J.A. Davidson, A.H. McDaniel, R.E. Shetter, and J.G. Calvert, *Temperature-dependent formaldehyde cross sections in the near-ultraviolet spectral region*, J. Phys. Chem. 94, 3902-3908, 1990.

For OCIO, see:

1) H. Kromminga, J. Orphal, S. Voigt, J. P. Burrows, to be published.

2) H. Kromminga, *Diploma Thesis*, IUP, University of Bremen, 1999.

3) H. Kromminga, S. Voigt, J. Orphal, J. P. Burrows, *UV-Visible FT Spectra of OCIO at Atmospheric Temperatures*, Proceedings of the 1st European Symposium on Atmospheric Measurements from Space, ESA Special Publication, 1999.

For O₂-O₂, see:

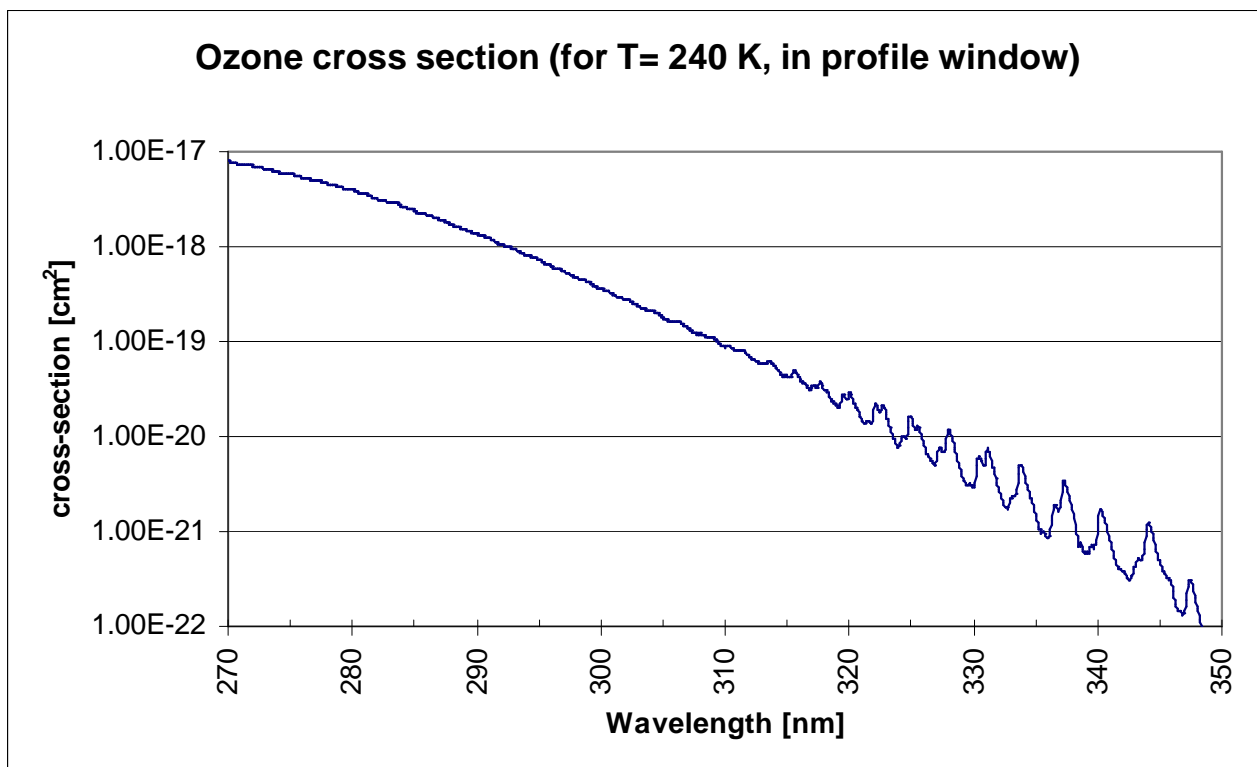
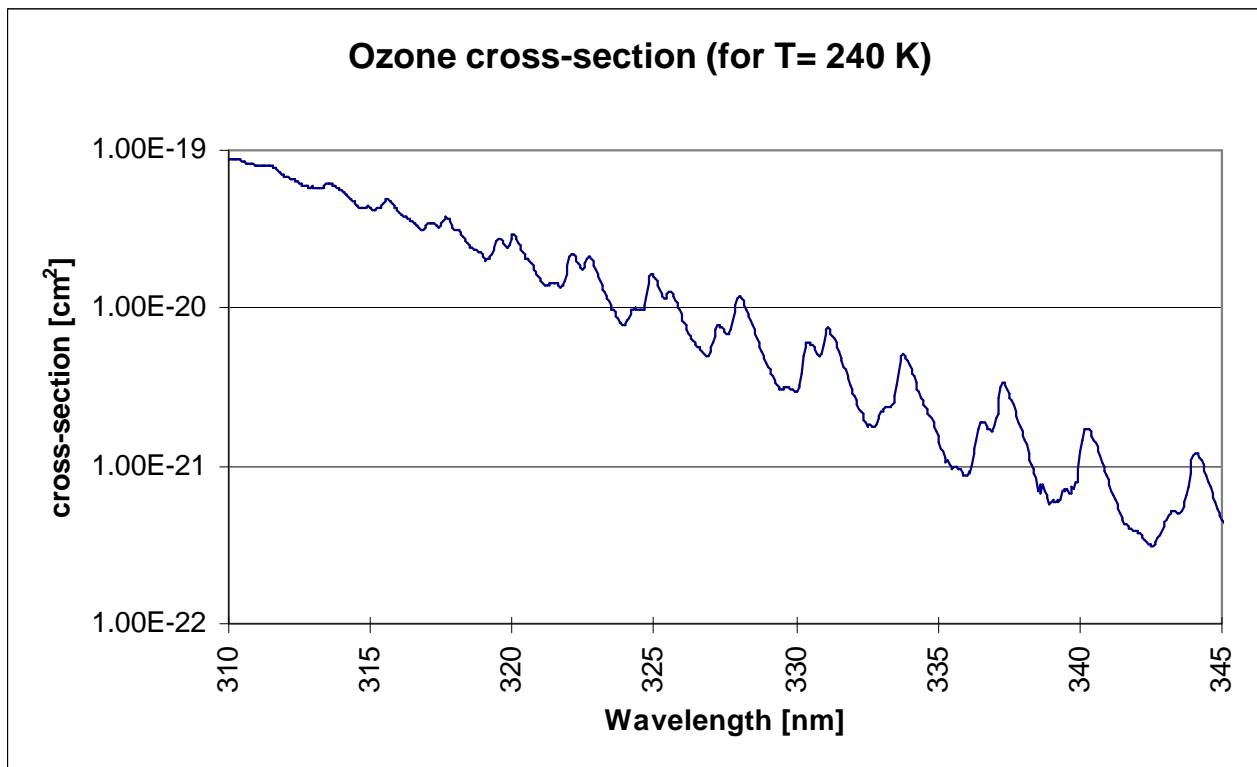
Greenblatt, G.D., J.J. Orlando, J.B. Burkholder and A.R. Ravishankara, , J. Geophys. Res., 95, 18577 – 18582.

For the Ringspectrum, see:

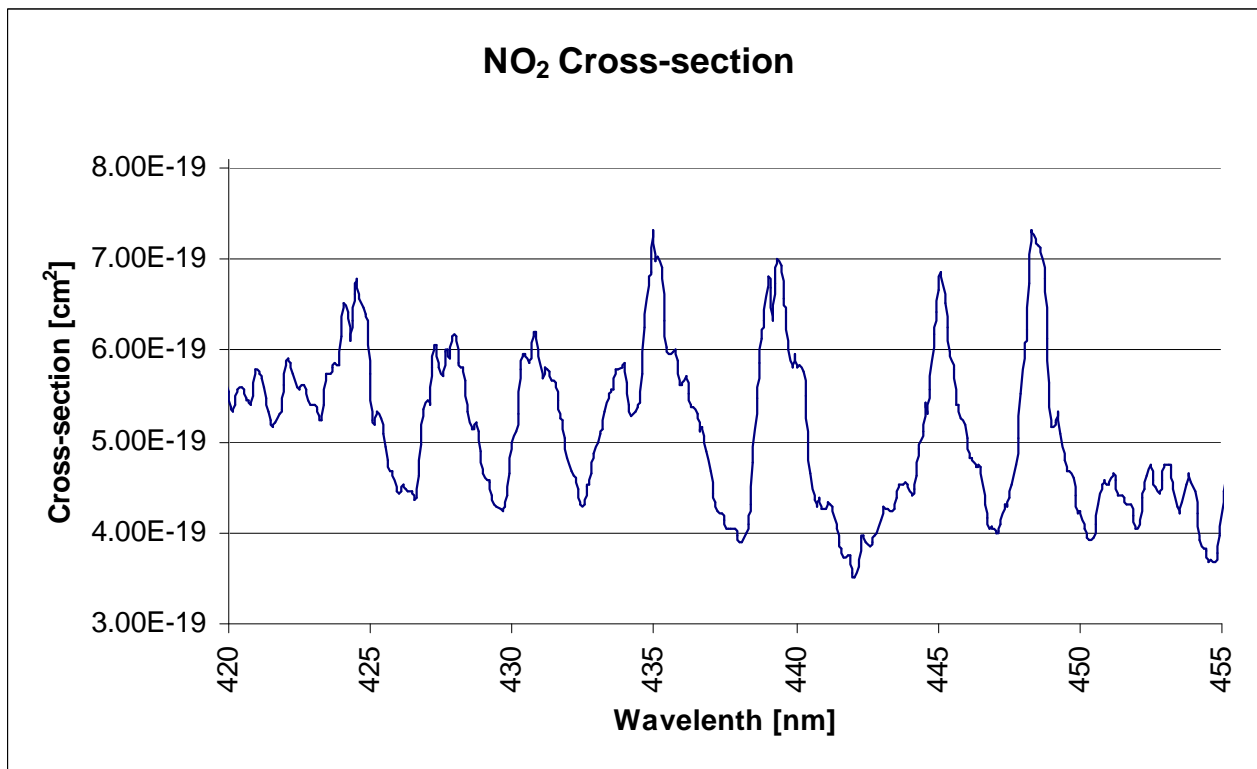
K. Chance and R.J.D. Spurr, *Ring Effect Studies: Rayleigh Scattering, Including Molecular Parameters for Rotational Raman Scattering, and the Fraunhofer Spectrum*, Applied Optics 36, 5224-5230, 1997.

K. Chance, private communication

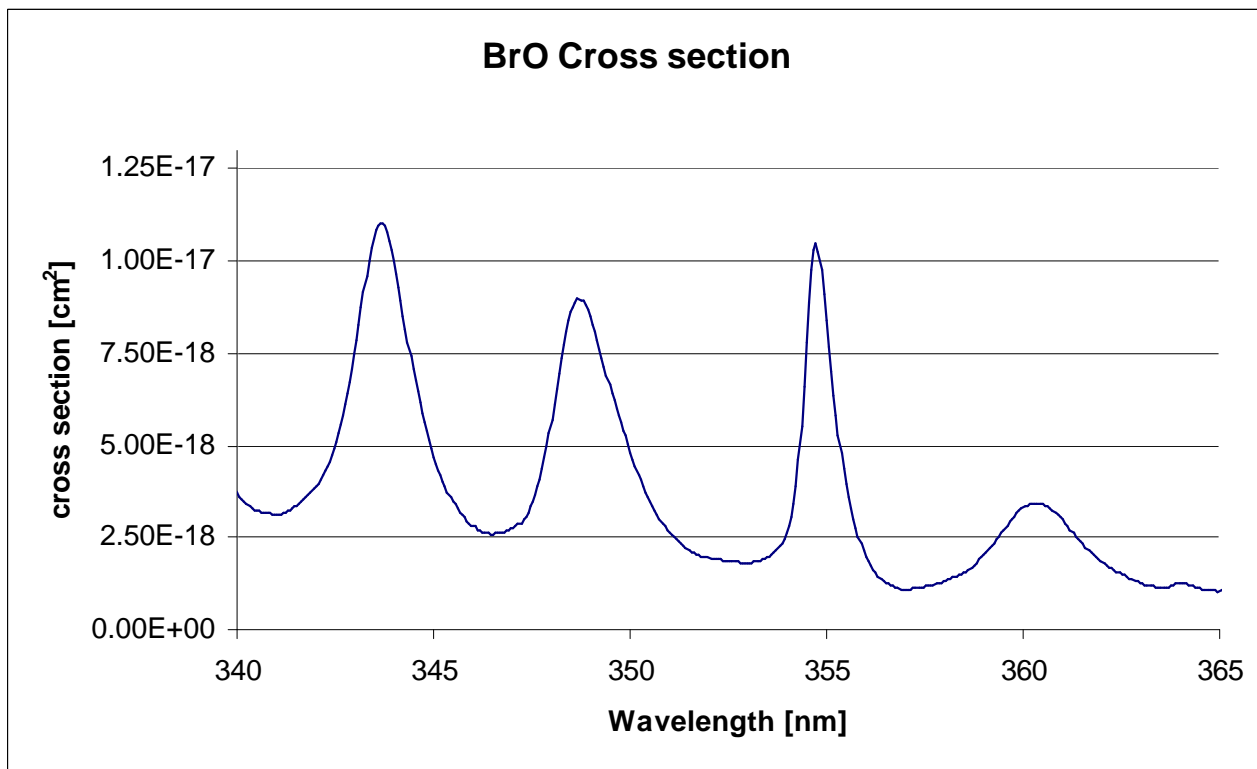
Ozone



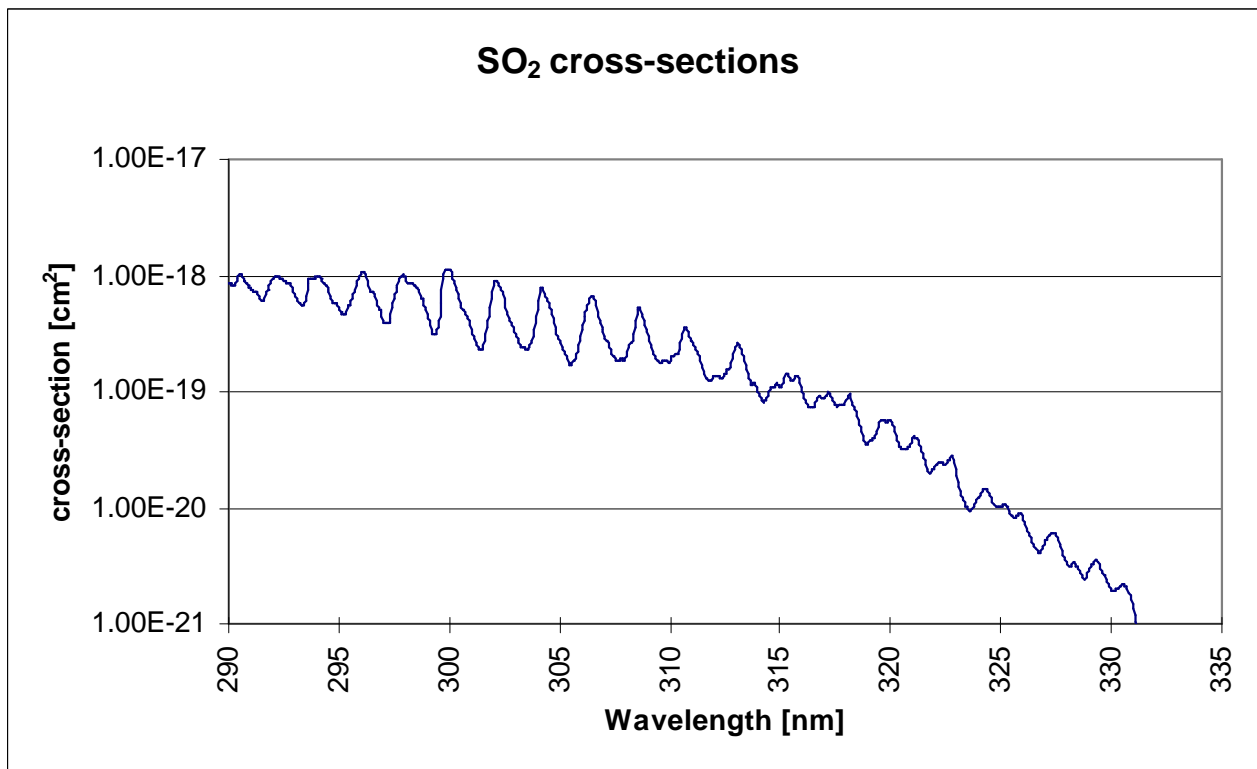
NO₂



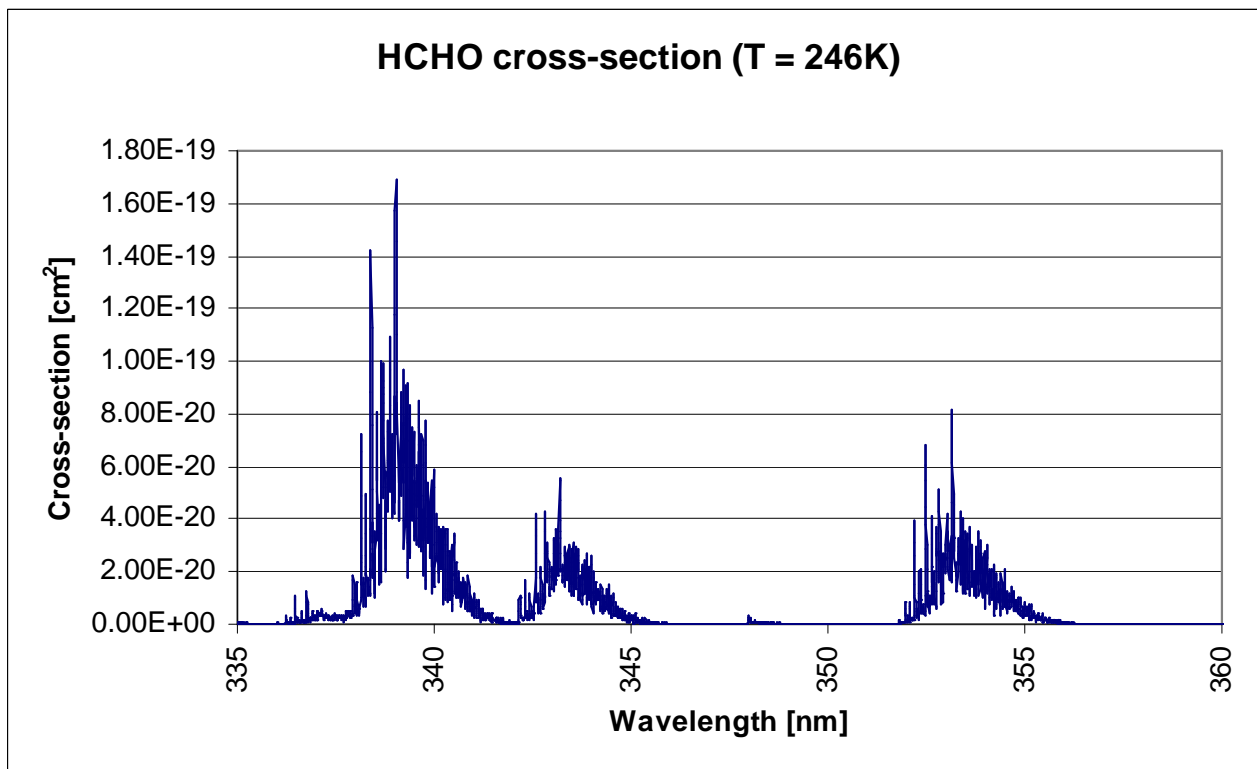
BrO



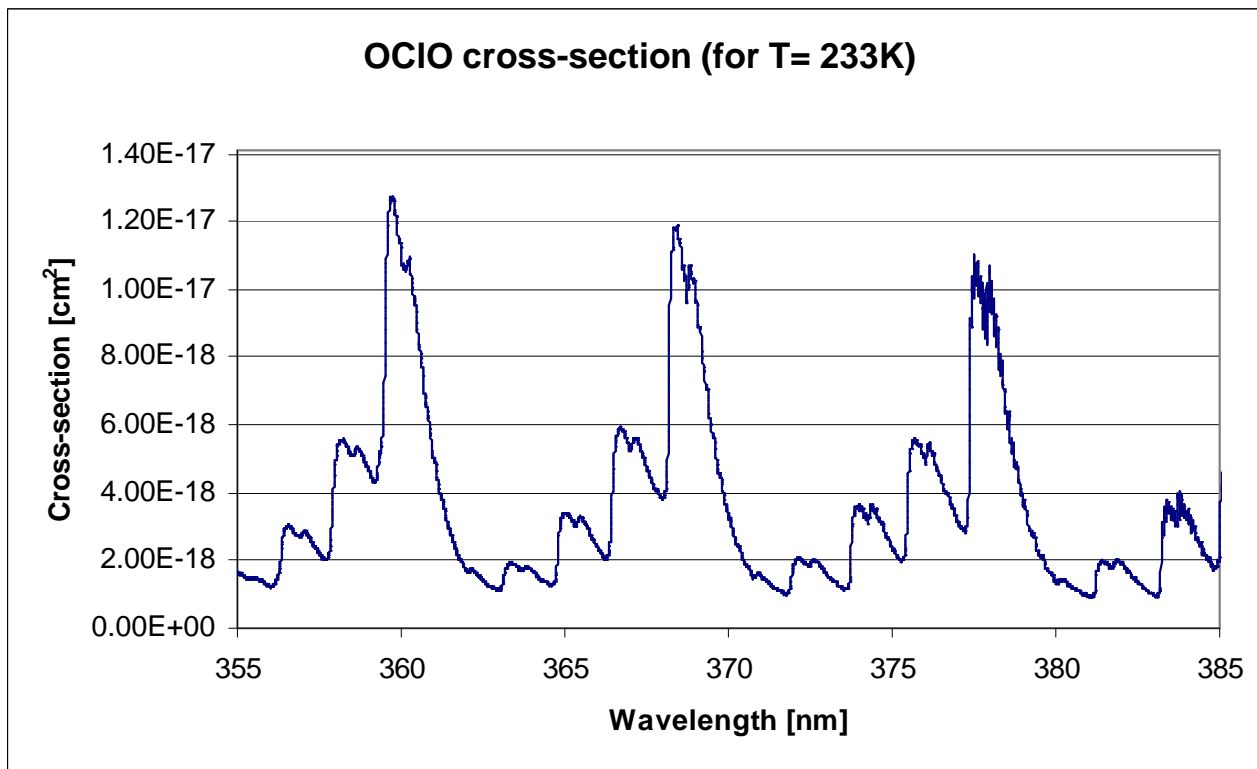
SO₂



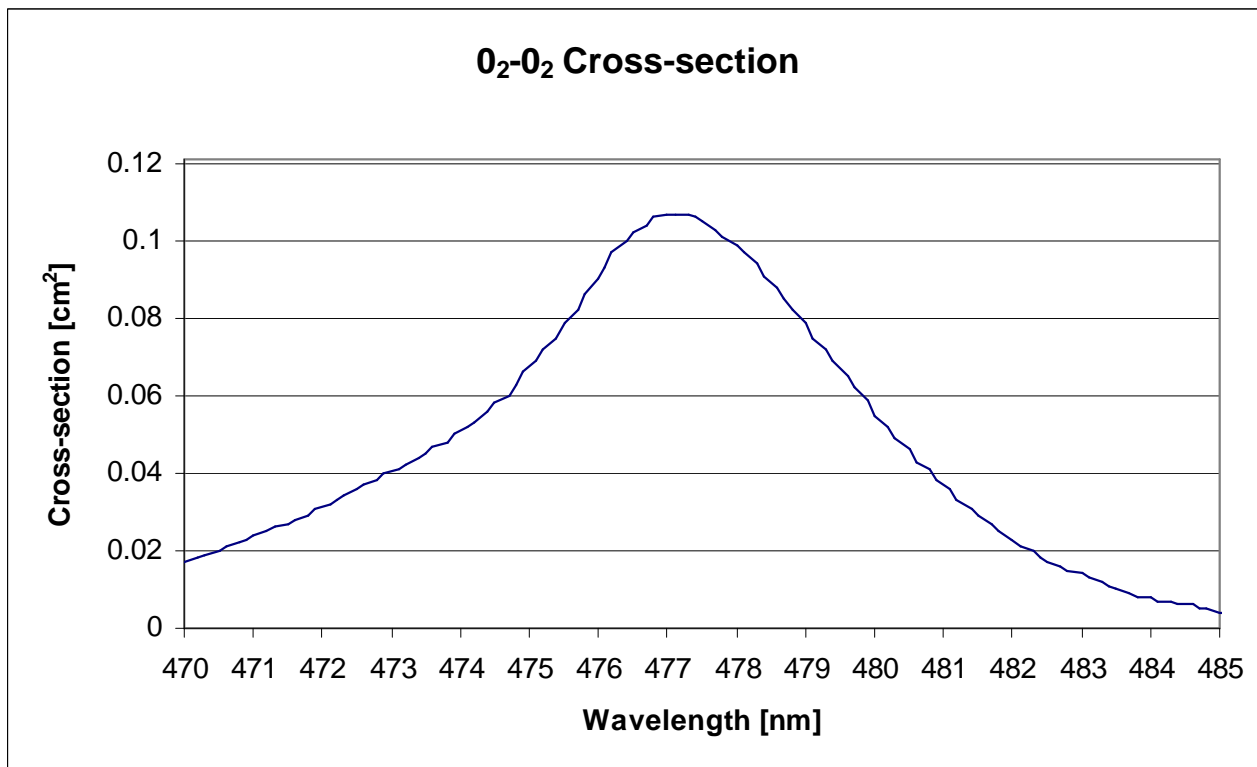
HCHO



OCIO



O₂-O₂



Ring spectrum

