ANALYSIS OF THE ν_2 BAND OF THE FCO_2 RADICAL: PRELIMINARY RESULTS

A. PERRIN, *Laboratoire Inter Universitaire des Systemes Atmosphériques, CNRS, Universités Paris 12 et 7, 61 Av du Général de Gaulle, 94010 Créteil Cedex France*; M. STŘIŽÍK, *VŠB-Technical University of Ostrava, Faculty of Safety Engineering, Lumírova 13, CZ-70030, Ostrava 3 - Výškovice, Czech Republic, Institute of Thermomechanics, v.v.i., Academy of Sciences of the Czech Republic, Dolejškova 5, CZ-18200 Prague 8, Czech Republic*; H. BECKERS, H. WILLNER, *Inorg. Chemistry, University of Wuppertal, D-42119 Wuppertal, GERMANY*; Z.ZELINGER, P.PRACNA, *J. Heyrovský Institute of Physical Chemistry, Academy of Sciences of the Czech Republic, Dolejškova 3, CZ-18223 Prague 8, Czech Republic*; V. NEVRLÝ, E. GRIGOROVÁ, *VŠB-Technical University of Ostrava, Faculty of Safety Engineering, Lumírova 13, CZ-70030, Ostrava 3 - Výškovice, Czech Republic, Institute of Thermomechanics, v.v.i, Academy of Sciences of the Czech Republic, Dolejškova 5, CZ-18200 Prague 8, Czech Republic.*.

The unique fluoroformyloxyl radical (FCO_2) is assumed to participate in atmospheric processes such as the degradation of hydrofluorocarbons that have been considered as chlorofluorocarbon substitutes. Despite this atmospheric interest, the molecular and spectroscopic properties of FCO_2 have not yet sufficiently been explored. The high resolution FT IR gas phase spectrum of the fluoroformyloxyl (FCO_2) radical was recorded in the 650 - 1500 cm^{-1} spectral range at the University of Wuppertal. Using this spectrum and the ground state parameters achieved recently[a] we carried out the first high resolution study of the ν_2 A-type band (C-F stretching mode) centered at 970.209 cm^{-1}. The analysis was difficult because the band is congested. In addition the spin doublets are difficult to identify except for high K_a values. However, we could take advantage of the fact that only K_a=odd values are observable for symmetry reasons. The line position calculation accounts for the spin rotation doubling and for the Fermi-type resonances linking the 2^1 and 5^2 spin rotation energy levels.

[a] Kolesnikova, Varga, Beckers, Simeckova, Zelinger, Nova Striteska, Kania, Willner, and Urban, J. Chem Phys 128, 224 (2008)