MILLIMETER WAVE SPECTRA OF METHYL CYANATE, METHOXYAMINE AND N-METHYLMETHOXYLAMINE: LABORATORY STUDIES AND ASTRONOMICAL SEARCH IN SPACE

LUCIE KOLESNIKOVÁ, JOSÉ L. ALONSO, CELINA BERMÚDEZ, E. R. ALONSO, Grupo de Espectroscopia Molecular, Lab. de Espectroscopia y Bioespectroscopia, Unidad Asociada CSIC, Universidad de Valladolid, Valladolid, Spain; BELÉN TERCERO, JOSE CERNICHARO, Molecular Astrophysics, ICMM, Madrid, Spain; J.-C. GUILLEMIN, Institut des Sciences Chimiques de Rennes, UMR 6226 CNRS - ENSCR, Rennes, France.

Recent discovery of methyl isocyanate (CH$_3$NCO) in Sgr B2(N) and Orion KL$^{a,b}$ makes methyl cyanate (CH$_3$OCN) a potential molecule in the interstellar medium. Methoxyamine (CH$_3$ONH$_2$) and its isomeric form N-methylhydroxylamine (CH$_3$NHOH) may be considered as a potential interstellar amines.$^c$ Pure rotational transitions belonging to the ground state and several excited vibrational states were measured and analyzed up to 400 GHz. Rotational transitions revealed A-E splitting due to the methyl internal rotation and were globally analyzed in order to provide a precise set of the spectroscopic constants. Results of this work were used to search for the spectral features of methyl cyanate in Orion KL, Sgr B2(N), B1-b and TMC-1 molecular clouds.$^d$