

INFRARED SPECTRA OF CARBONYL SULFIDE-ACETYLENE TRIMERS: $\text{OCS}-(\text{C}_2\text{H}_2)_2$ AND TWO ISOMERS OF $(\text{OCS})_2-\text{C}_2\text{H}_2$

MAHIN AFSHARI, M. DEHGHANY, J. N. OLIAEE, N. MOAZZEN-AHMADI, *Department of Physics and Astronomy, University of Calgary, Calgary, AB T2N 1N4, Canada*; A.R.W. MCKELLAR, *Steacie Institute for Molecular Sciences, National Research Council of Canada, Ottawa, ON K1A 0R6, Canada*.

Spectra of acetylene-carbonyl sulphide trimers in the region of the OCS ν_1 fundamental ($\sim 2062 \text{ cm}^{-1}$) are observed using a tunable diode laser to probe a pulsed supersonic slit jet expansion. A previous microwave study of $(\text{OCS})_2-\text{C}_2\text{H}_2$ by Peebles and Kuczkowski^a gave a nonplanar triangular twisted structure, which could be thought of as a polar OCS dimer plus a C_2H_2 monomer lying above the dimer plane. In the present work, three infrared bands are analyzed. The first band clearly belongs to this previously known $(\text{OCS})_2-\text{C}_2\text{H}_2$ complex. The second band can be assigned as an isomer of $(\text{OCS})_2-\text{C}_2\text{H}_2$ having a similar structure, but with a nonpolar OCS dimer plus a C_2H_2 monomer above the dimer plane. The third band is assigned to $\text{OCS}-(\text{C}_2\text{H}_2)_2$. The rotational constants and dipole moment components of all three bands are consistent with barrel shape structures having C_1 , C_2 and C_s symmetries, respectively.

^aS.A. Peebles and R.L. Kuczkowski, *J. Chem. Phys.* **111**, 10511 (1999).