DETECTION OF ROTATIONAL SPECTRA OF He-CONTAINING VAN DER WAALS COMPLEXES WITH A FOURIER TRANSFORM MICROWAVE SPECTROMETER

YUNJIE XU and WOLFGANG JÄGER, *Department of Chemistry, University of Alberta, Edmonton, AB, Canada, T6G 2G2*.

The recent report of the rotational spectrum of He-OCS by Higgins and Klemperer [a] encouraged us to search for transitions of He-containing van der Waals complexes with our pulsed molecular beam Fourier transform microwave spectrometer. It was possible to measure additional transitions of the normal isotopomer and the previously unobserved spectra of several rarer isotopomers of He-OCS, including He-OC^{34}S, He-O^{13}CS, and He-OC^{33}S. ^{33}S nuclear quadrupole hyperfine structure could be resolved and analyzed in case of He-OC^{33}S. Spectra of two further He-molecule complexes, i.e. He-CO [b] and He-CO_2, [c] will also be presented. For He-CO, transitions of the rarer isotopomers He-C^{18}O, He-^{13}CO, He-^{13}C^{18}O, and He-^{13}C^{17}O were also measured. In the case of He-CO_2 it was possible to detect transitions of three more istotopomers, i.e. He-$^{13}CO_2$, He-^{18}O^{13}CO, and He-^{17}OCO. For both ^{17}O containing complexes, the ^{17}O nuclear quadrupole hyperfine structures were detected and analyzed.

[a] K. Higgins and W. Klemperer, J. Chem. Phys. 110, 1383 (1999).
[b] M.-C. Chan and A. R. W. McKellar, J. Chem. Phys. 105, 7910 (1996)
[c] M. J. Weida, J. M. Sperhac, and D. J. Nesbitt, J. Chem. Phys. 101, 8351 (1994)