

DIRECT OBSERVATION OF THE vdW BENDING BAND OF THE OCO-HF CLUSTER  
IN THE MILLIMETER-WAVE REGION

M. ISHIGURO, and T. TANAKA, *Department of Chemistry, Faculty of Science, Kyushu University 33, Higashiku, Fukuoka, 812-8581, Japan*; K. HARADA, and K. TANAKA, *Institute for Molecular Science, Myodaiji, Okazaki, 444-8585, Japan*.

The rovibrational transitions in the low frequency bending (vdW) mode of the intermolecular hydrogen bond in the OCO-HF cluster have been observed by millimeter-wave and submillimeter-wave spectroscopy combined with pulsed supersonic jet expansion technique. In this study, we observed 30 lines belonging to the  $v_{bend}^l = 1^1 - 0^0$  band in the frequency region from 260 to 320 GHz, where  $v^l$  denotes quanta of OCO-HF skeletal bend excitation with  $l$  units of vibrational angular momentum. The observed spectra were analyzed with a linear molecule Hamiltonian and the band origin is determined to be 272548.8016(49) MHz. We also detected several lines of the P-branch transitions of the  $v_{bend}^l = 2^2 - 1^1$  hot band.