DIRECT OBSERVATION OF THE vdW MODE OF Ar-SH BY DOUBLE RESONANCE TECHNIQUE IN THE MILLIMETER WAVE REGION

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Rovibrational transitions of a vdW mode of the Ar-SH complex have been observed by applying an FTMW-millimeter wave (mMW) double resonance technique recently developed in our laboratory to expand the observable region beyond 40 GHz. Rovibrational transitions to the P=1/2 excited state have been observed in the frequency region from 75 to 110 GHz by monitoring transitions in the cm wave region. Observed rovibrational frequencies are in good agreement with those calculated using the previously determined potential energy surface [a] [b]. Differences of about 1% indicate the validity of the previous analysis based on the results of FTMW experiments and $ab\ initio$ calculations. Detailed energy level structure of the P=1/2 state has been determined from the present observation, in which the parity splitting is quite large in contrast to that in the ground state, and consequently the rotational structure is well described by the case (b) coupling scheme.

[a] Y. Sumiyoshi, et al. *J. Chem. Phys.* **113**, 10121 2000.
[b] Y. Sumiyoshi, et al. *J. Mol. Spectrosc.* **222**, 22 2003.