ROTATION OF METHANE AND SILANE MOLECULES IN HELIUM DROPLETS

DMITRY S. SKVORTSOV, *Chemistry Department, University of Southern California, Los Angeles, California 90089*; HIROMICHI HOSHINA, *Terahertz Sensing and Imaging Laboratory, RIKEN; 519-1399 Aramaki Aoba, Aoba-ku, Sendai, Miyagi, 980-0845, Japan*; BORIS G. SARTAKOV, *General Physics Institute, Vavilov str. 38, 117942 Moscow, Russia*; and ANDREY F. VILESOV, *Chemistry Department, University of Southern California, Los Angeles, California 90089*.

Spectra of the ν_3 band of CH_4, CD_4, SiH_4 and SiD_4 embedded in helium droplets have been obtained. Band origins and rotational and centrifugal distortion constants were acquired. Comparison of the rotational constants of normal and deuterated molecules facilitates the studying of the dependence of the effective rotational constants in helium on the molecular moment of inertia. Large differences in the rotational constants of deuterated methane and silane in helium droplets, which have very similar rotational constants in gas-phase, are ascribed to a different interaction strength of the molecules with the helium environment.