CARS STUDY OF LIQUID PARA-HYDROGEN AT DIFFERENT TEMPERATURES

RUSSELL SLITER, MICHAEL MAKRIS and ANDREY F. VILESOV, *Department of Chemistry, University of Southern California, Los Angeles, CA 90089*.

Vibrational and rotational spectra of liquid para-H_2 at temperature T = 14 - 26 K and at pressures less than 25 bar have been obtained using coherent anti-Stokes Raman scattering technique. The spectra in solid para-H_2 have also been measured at T = 6 - 13 K. The vibrational frequency in the liquid increases with temperature by about 2 cm^{-1}, and the shift scales with the square of the density of the sample. An extrapolation of the vibrational frequency in metastable para-H_2 liquid below the freezing point is discussed. The results of this study indicate that the vibron hopping between the molecules is active in the liquid, similar to that previously found in the solid.