CARS SPECTRA OF COLD H_2 CLUSTERS

KIRILL E. KUYANOV, *Department of Chemistry, University of Southern California, Los Angeles, CA 90089*; MIKHAIL N. SLIPCHENKO, *Department of Chemistry, Iowa State University, Ames, IA 50011*; BOBBY KHALAJESTANI, RUSSELL SLITER and ANDREY F. VILESOV, *Department of Chemistry, University of Southern California, Los Angeles, CA 90089*.

Neat H_2 clusters as well as H_2 clusters embedded in helium droplets have been obtained in a pulsed cryogenic nozzle beam expansion and studied via Coherent anti-Stokes Raman Scattering (CARS) technique. The motivation for these experiments is to spectroscopically observe superfluidity in molecular hydrogen clusters. Results on large hydrogen clusters of about 10^4 molecules presented. We have studied the composition and structure of the clusters obtained from the H_2 gas with different concentrations of $para$-H_2 and $ortho$-H_2 molecules. CARS spectra indicate the enrichment in $ortho$-H_2 in the clusters.