LASER INDUCED FLUORESCENCE OF TETRACENE IN HYDROGEN DROPLETS

SUSUMU KUMA, HIROKO NAKAHARA, and TAKAMASA MOMOSE, *Department of Chemistry and Department of Physics and Astronomy, The University of British Columbia, Vancouver, B.C., V6T1Z1, Canada*.

Hydrogen clusters at low temperatures have been attracted attention because of their relevance to molecular superfluidity. In order to investigate the property of large hydrogen clusters ($N > 10,000$), we have observed laser induced fluorescence of tetracene embedded in hydrogen droplets. Droplets of hydrogen molecules were generated by the similar method as that of He droplets. The size of the hydrogen droplets thus produced is supposed to be about 10^5 molecules and its temperature is about 4 K.[a] Laser induced fluorescence spectrum of tetracene in normal hydrogen droplets is almost identical to that observed for tetracene-(n-H_2)$_N$ clusters ($N \approx 600$) embedded in He droplets at 0.4K, which indicates that tetracene is inside the hydrogen droplets similar to the case of He droplets. The LIF spectrum shows clear dependence on the concentration of orthohydrogen in hydrogen droplets. We will discuss the properties of hydrogen clusters at 4 K and 0.4 K by comparing spectra observed under various conditions.

[a] E. L. Knuth, F. Schunemann and J. P. Toennies, *J. Chem. Phys.* **102**, 6258 (1995).