INFRARED LASER SPECTROSCOPY OF METHANE-PARAHYDROGEN CLUSTER IN HELIUM DROPLETS

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The clusters of methane with para-hydrogen molecules (CH_4-(p-H_2)$_n$ n=1$\sim$30) were formed in He droplets and studied via laser depletion spectroscopy. The rotationally resolved ν_3 transition of the cluster was observed with changing the number of hydrogen molecules. Large spectral change was seen around n=12 and 30, which suggests the completion of the first and second H_2 solvation shells of the CH_4 molecule. The aggregate state of the H_2 cluster is discussed.