INFRARED SPECTRA AND INTENSITIES OF WATER-AMMONIA COMPLEXES IN HELIUM DROPLETS

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The infrared spectra of the H_2O-NH_3 complexes in He droplets were measured in the range of the hydrogen stretching vibrational bands of water molecules. We observed two bands which were ascribed to the bonded and free OH stretching vibrations of water molecules. The infrared intensity ratio of the H_2O-NH_3 complex and the single water molecule in this range was determined on the basis of the Poisson distribution of those abundances in He droplets. Infrared intensity of OH stretching vibrations in complexes was found to be 3 times larger that that of free molecules. The enhancement is ascribed to the formation of a hydrogen bond. Both the frequencies and intensities are compared to previous matrix isolation studies and theoretical calculations.

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