ELECTRONIC SPECTROSCOPY OF MOLECULES IN HELIUM DROPLETS

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Single molecules as porphyrins and indoles are captured inside large He droplets having 10^3 - 10^5 atoms in a molecular beam and studied via high resolution laser spectroscopy in the visible and near ultraviolet ranges. The phonon wings of sharp vibronic transitions of small molecules provide evidence that the ^{4}He droplets are superfluid. For the larger molecules split zero phonon lines and structured phonon wings have been observed. These are explained by considerable localization of the helium atoms in the first solvation shell of the larger molecules. Electronic spectra of van der Waals complexes in helium droplets are reported.