RYDBERG STATES OF Na-DOPED HELIUM NANODROPLETS

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The dynamics of excited Na atoms located on the surface of helium nanodroplets have been investigated by a variety of spectroscopic techniques. The excitation spectrum of Na-doped helium nanodroplets has been recorded up to the sodium ionization threshold. All lines in the excitation spectra are shifted and broadened with respect to the corresponding atomic lines. It has been found that upon excitation bare Na^* atoms as well as Na^*He_N $(N = 1 - 6)$ complexes desorb from the surface. Photoelectron spectroscopy reveals desorption of Na^* not only in the initially excited states but also in lower lying states, indicating that relaxation plays an important role. Ion imaging experiments indicate that the mean kinetic energy of the desorbed Na^* atoms increases linearly with excitation energy. These observations can be largely explained by treating the helium droplets as an ideal gas.