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Photoelectron Spectroscopy of Doped Helium Nanodroplets
OLEG KORNILOV, CHIA WANG, JEONG HYUN KIM, DARCY PETERKA, OLIVER GESSNER, DANIEL NEUMARK, Lawrence Berkeley Laboratory, UC Berkeley — Helium nanodropets are unique in their ability to pick-up foreign species and facilitate formation of cryogenically cold (0.4 K) virtually unperturbed complexes. These properties stem from the droplets' superfluid nature and very weak interaction potential making helium one of the best media for matrix-isolated spectroscopy. Variety of methods has already been applied to embedded complexes including infrared, visible and UV spectroscopy. To complement this picture, in the present contribution photoelectron spectroscopy is used to conduct a systematic study of photoelectron dynamics in He droplets. Droplets doped with rare gas atoms (Ne, Ar, Kr, Xe) are investigated using tunable VUV light of Advanced Light Source at LBNL. Indirect photoionization is observed followed by both direct escape of photoelectron and energy loss mechanism of uncertain nature. Prospects for time-resolved studies of photoelectron dynamics in He droplets are discussed.

Oleg Kornilov
Lawrence Berkeley Laboratory, UC Berkeley

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