

Photoelectron spectroscopy on free simple metal clusters and fullerenes

Bernd v. Issendorff
Fakultät für Physik
Universität Freiburg

The electronic structure of nanoparticles is dominated by quantum size effects. Photoelectron spectroscopy is an ideal tool to study these effects, as in principle it yields a direct image of the highly discretized electronic density of states. Angular resolved photoelectron spectroscopy goes one step further, as it yields additional information about the character of the electronic wave functions. In Freiburg recently an imaging photoelectron spectrometer has been set up, which now has been used to measure angular resolved photoelectron spectra of size selected, cold, free sodium clusters in a size range of 3-147 atoms. Surprisingly diverse angular distributions have been found, which underline the validity of the simple electron shell model and demonstrate the coherence of the electron emission process. Additionally new results of time-resolved photoelectron spectroscopy on fullerene anions will be discussed, which demonstrate the richness of the ultrafast dynamics in these interesting model systems.