

## Photoelectron spectroscopy of size-selected cluster ions using synchrotron radiation

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Catalytic properties of metal clusters exhibit a pronounced size dependence. In general, catalytic properties depend on the chemisorption bond between the molecule (e.g., CO) and the catalyst. One well studied case is the chemisorption of CO to metal surfaces. Depending on the metal, the 4 sigma, 1 pi and 5 sigma orbitals which form the bond show strong variations in binding energy. For clusters, similar variations are expected to occur depending on the size of the particles. So far, such experiments could not be performed because of low intensities. For photoelectron spectroscopy on size selected clusters, high intensity light sources (lasers) had to be used to compensate for the low target densities. The photon energies of lasers are too low for the spectroscopy of adsorbate orbitals. We present a new setup combining a high intensity cluster ion source and a velocity map imaging electron spectrometer /1/. The new setup employs synchrotron radiation for the photoelectron spectroscopy of size selected cluster ions.

### References

/1/ Thomas Schramm, Gerd Ganteför, Andras Bodi, Partick Hemberger, Thomas Gerber, Bernd von Issendorff, Applied Physics A 115, 771 (2014).

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