

Double Photoionization of Aromatic Hydrocarbons

Ralf Wehlitz

Synchrotron Radiation Center, University of Wisconsin-Madison, Stoughton, WI 53589

Electron correlations can be found in various fields of physics whenever we have to go beyond the independent particle model. A convenient method to study electron correlations in gas-phase atoms and molecules is to measure the probability to remove *two* electrons simultaneously with a single photon (called double photoionization) from the sample. Because a single photon can interact with only one electron, the removal of two electrons is due to electron correlations.

I will present our recent results on double photoionization of aromatic hydrocarbons over a broad range of photon energies.^{1,2} Our goal is to find systematic trends as the structure of our different sample molecules changes. Questions that will be addressed in the talk are: How differ molecules from atoms regarding double photoionization? How does the structure of a molecule affect the double-photoionization process? Which mechanisms contribute to double photoionization?

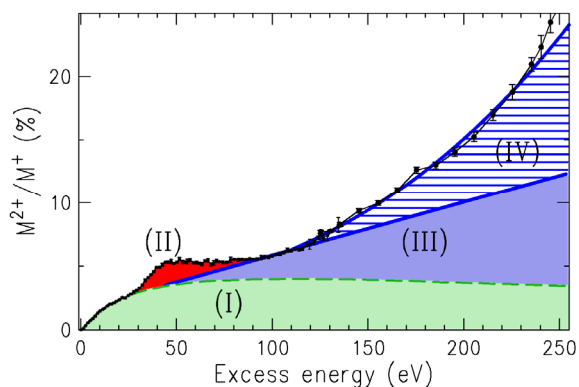


Fig. 1: Ratio of doubly to singly charged parent ions of deuterated benzene. The differently shaded areas correspond to different double photoionization mechanisms.³

References

- 1) T. Hartman *et al.*, Phys. Rev. Lett. **108**, 023001 (2012).
- 2) R. Wehlitz *et al.*, Phys. Rev. Lett. **109**, 193001 (2012).
- 3) T. Hartman *et al.*, Phys. Rev. A **87**, 063403 (2013).