MS 6: Clusters and Molecules

Time: Wednesday 14:00–15:00 Location: U A-Esch 2

Invited Talk MS 6.1 Wed 14:00 U A-Esch 2

Impact of the Coulomb barrier on the electronic and optical properties of polyanionic silver clusters — Klara Raspe[1], Norman Iwe[1], Madlen Müller[2], Franklin Martinez[1], •Josef Tiggesbäumker[1,3], Lutz Schweikhard[2], and Karl-Heinz MeiwesBroer[1,3] — [1]Institut für Physik, Universität Rostock, Albert-Einstein-Str. 23, 18059 Rostock — [2]Institut für Physik, Universität Greifswald, Felix-Hausdorff-Str. 6, 17489 Greifswald — [3]Department life, Light and Matter, Universität Rostock, Albert-Einstein-Str. 25, 18059 Rostock

Polyanions are ubiquitous in nature, but usually a solvent is necessary to stabilize the complexes. Experiments in a molecular beam offer the possibility to exclude effects of the environment and, thus, give access to the properties of the bare systems. A general property of gas-phase polyanions is the presence of a Coulomb barrier, which allows for metastable electron states above the vacuum level. Therefore, electronic relaxation, i.e., electron tunneling through the barrier, has to be taken into account, in particular, after photoexcitation into weakly bound levels. We produce polyanions in a digital radio-frequency ion trap in order to conduct photoelectron spectroscopy on silver clusters Ag_N^{z-} (N up to 800, z=1..6). Tuning the laser photon energy and recording the corresponding electron spectra the optical spectra are extracted. The analysis reveals, that electron tunneling has to be taken into account in order to determine size and charge-state selective plasmon energies of silver cluster polyanions. The results on Ag_N^{z-} will be compared to measurements on singly charged Ag_N^+ and Ag_N^-.

Invited Talk MS 6.2 Wed 14:30 U A-Esch 2

Hitting proteins with a sledgehammer – mass spectrometry meets X-rays — •Charlotte Uetrecht — Heinrich Pette Institute, Hamburg, Germany — European XFEL, Schenfeld, Germany

Native ion mobility mass spectrometry (MS) is a perfect tool to study protein complexes in a mass and conformation specific manner, albeit with low structural resolution. On the other hand, it allows monitoring structural transitions, which cannot be purified and are inaccessible for crystallography. The European XFEL, the world's most intense hard X-ray free-electron laser (XFEL), has just become operational and offers an opportunity to obtain high resolution structures of single particles. The benefits of native MS for single particle imaging of transient intermediates at European XFEL and initial feasibility studies will be presented. Furthermore, we employed soft X-rays from synchrotrons and FELs for fragmentation in native MS. Our recent results show great potential for using soft X-rays in native top-down MS. The available intensity could alleviate proposed upper size limits for UV photo dissociation of protein complexes.