



Innsbruck Physics Colloquium

Structure and spectroscopy of metal containing cluster ions

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Isolated, metal-atom-containing cluster ions have been of interest in cluster science for many years. Tractable size ranges continue to evolve, e.g. from simple alkali halide clusters to experimentally more demanding metal-organic aggregates. Thus cluster science has become increasingly relevant for other fields of science such as nanotechnology, heterogeneous catalysis or mainstream chemistry. Advancements in hybrid mass spectrometric methods have made this possible --- driven to a significant degree by technology developed in the cluster community. The talk will cover two recent uses of such hybrid methods in combination with density functional theory.

The first example relates to photoluminescent metal-organic aggregates containing transition- or lanthanoid cations held together by anionic antennas. Whereas the cluster size and composition dependent emission spectroscopy of isolated cationic luminophores can be probed by trapped ion photoluminescence measurements, this is not the case for isolated multianionic congeners. Instead they undergo excited state electron tunneling detachment on various timescales as studied by time-resolved photoelectron spectroscopy.

The second example concerns the size-dependent structure of isolated ruthenium cluster anions and of hydrogenated derivatives thereof, which we have determined by trapped ion electron diffraction. Supported ruthenium clusters are among the best present day ammonia synthesis catalysts.

DK-ALM Pre-Talk: 16:30 h

Michael Rader "Finite Correlation Length Scaling in Lorentz-Invariant Gapless iPEPS Wave Functions"

Snacks will be provided in between the pre-talk and the colloquium.

**Colloquium: Tuesday, 15.01.2019
17:15 h in lecture hall C**

Innsbruck Physics Colloquium, Organisation: M. Beyer, H.-C. Nägerl, A. Reimer