High energy spectroscopical analysis of the charge transfer and the electronic structure of metallofullerenes.

T. Pichler,[1] L. Alvarez,[2] M. Knupfer,[2] M. S. Golden,[2] J. Fink,[2] P. Rudolf,[3] L. Kjeldgaard,[4] P. Brhwiler,[4] R. Follath,[5] A. Goldoni,[6] P. Georgi,[2] L. Dunsch[2] and H. Shinohara[7]

[1]IFW-Dresden and
University of Vienna
Helmholtzstr. 20
Strudlhofg. 4
Dresden/Vienna D-01171/A-1190
Germany/Austria

[2]IFW-Dresden
Helmholtzstr. 20
Dresden D-01171
Germany

[3]LISE-FUNDP
Rue de Bruxelles 61
Namur B 5000
Belgium

[4]Uppsala University
BOX 530
Uppsala S-751 21
Sweden

[5]BESSY Gmbh.
Lentzealle 100
Berlin D-14195
Germany

[6]ELETTRA
Area Science Park
Basovizza S.S. 14, km. 163.5
Italy

[7]Nagoya University
Department of Chemistry
Nagoya J-464-01
Japan

We present recent results on the electronic structure of pristine and alkali-metal intercalated endohedral metallofullerenes encaging rare earth ions such as Tm, Ce, Gd or transition metals such as Sc or nitrides like Sc3N. Using photoemission spectroscopy and x-ray absorption spectroscopy as probes a comparative study of the charge thansfer and the effect of covalency on the electronic structure in different metallofullerenes will be presented. Particular emphasis is placed upon the effects of combined endohedral and exohedral doping by alkali metal intercalation on the electronic structure, as well as on the valency of the encapsulated metal ion(s).

This work is supported by the EU as part of the TMR Research Network 'FULPROP'(ERBFMRXCRT-970155). T. P. thanks the austrian academy of sciences for an APART grant.