MAGNETISM OF ANIONS: XMCD STUDY.

A. Rogalev, F. Wilhelm and J. Goulon
European Synchrotron Radiation Facility (E.S.R.F.)
B.P.-220, F-38043 Grenoble CEdex, FRANCE

One of the key issues in physics of magnetic materials is to unravel how the localized magnetic moments carried by paramagnetic atoms are coupled to each other and to the surroundings. The later coupling strongly depends on the nature of the chemical bonding in a compound. Even though the interplay between the chemical bonding and magnetism has been a subject of studies for a long time, the mechanisms of magnetic interactions involving valence electrons are not yet well understood. X-ray magnetic circular dichroism (XMCD), being element and orbital selective, provides us with a unique experimental tool to disentangle the role of each element in both the chemical bonding and the magnetic coupling.

We present here the first systematic XMCD studies of the magnetic properties of anions in various ferromagnetic rare-earth and actinide based compounds (semiconductors, intermetallics and multilayered systems). The observation of relatively large XMCD signals at the K-edges of anions unambiguously demonstrates that p valence electrons can be strongly polarized *via* hybridization with the outer shell electrons of magnetic neighbors and, therefore, are involved in magnetic interactions.

9.7 cm

13.4 cm

Subject category :

4. Rare Earths and Actinides, Alloys and Compounds

Presentation mode :
oral

Corresponding author :
A. Rogalev

Address for correspondence :
European Synchrotron Radiation Facility (E.S.R.F.)
B.P.-220, F-38043 Grenoble Cedex, FRANCE

Email address :
rogalev@esrf.fr