

Chiral Molecule-based Magnets

Laboratory:

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Lab Language/Langue de travail:

French/English

Abstract:

In continuation with previous work the objective of this thesis is the development and characterization of chiral molecular magnetic systems highlighting original magnetic phenomena such toroidal magnetization or skyrmions [1-5].

A main part of the thesis work will be devoted to the chemical synthesis of the original complexes following coordination chemistry methods. This comprises the synthesis of ligands such as free nitroxide radicals as spin carriers. The PhD student will be also involve in the determination of the crystal structures of his compounds by X-ray single crystal as well the study of their magnetic properties using a SQUID magnetometer.

The project benefits from the strong expertise of the host team in coordination chemistry, crystallography and in the study of molecular magnetism and of equipment available at the *Laboratoire des Multimatériaux et Interfaces (UMR CNRS 5615)* and within the *Institute of Chemistry of Lyon*. It also benefits of a national and international network of collaborations.

Skills required: good skill in chemical synthesis with strong background in chemistry and some aptitudes for the physics. .

Skills to be developed: expertise in organic coordination chemistry as well as autonomy in crystallographic and magnetic studies.

References

[1] G. Novitchi, G. Pilet, L. Ungur, V. V. Moshchalkov, W. Wernsdorfer, L. F. Chibotaru, D. Luneau, A. K. Powell *Chem. Sci.*, **2012**, 3, 1169–1176

[2] O. Iasco, G. Novitchi, E. Jeanneau, W. Wernsdorfer, D. Luneau *Inorg. Chem.* **2011**, 50, 7373–7375

[3] S. Petit, P. Neugebauer, G. Pilet, G. Chastanet, A-L Barra, A. B. Antunes, W. Wernsdorfer, D. Luneau *Inorg. Chem.*, **2012**, 51, 6645–6654

[4] Thèse [Olga Iasco](#), **2011** *Aimants moléculaires à base de clusters polymétalliques : synthèse, structures cristallines et étude des propriétés magnétiques* (<http://www.theses.fr/2011LYO10226>)

[5] see also list of publication on web page ([link publications](#))