Mössbauer under electric fields for the study of magnetoelectric materials

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Résumé

Magnetoelectric coupling refers to the possibility of controlling the magnetic properties of a material through the application of electric fields, or vice-versa. This has been a property of interest from multiferroic to spin-chiral materials, as it creates a new degree of freedom for their manipulation. Of particular interest in this context are either new techniques that probe such properties, but also the “upgrading” of classical techniques to allow for the inclusion of a new “degree of freedom” in the experimental process.

We have previously undertaken the use of electric fields in Electron Paramagnetic Resonance for the study of the magnetoelectric coupling in the molecular spin triangle (Fe3O(O2CPh)6(py)3)ClO4·py (Fig. 1). Expanding this to Mössbauer spectroscopy would be of particular interest given the nature of this spectroscopy, since its local-probing character could reveal important information on the magnetic states of individual magnetic ions upon application of an electric field.

In this talk, we will refer to our first attempts to tackle this problem, to experimental complications arising therefrom, and also to some preliminary results.

References


Mots-Clés: magnetoelectric coupling, molecular magnets

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