**From Insertion-Grafting to Exfoliation in Layered Functional Systems**

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Chemical and structural versatility of layered metal hydroxides and oxides allows for insertion and grafting of various kinds of functional molecules in between magnetic or ferroelectric sheets. This ability is promising for generating multi-functionality. Numerous properties can be combined as conductivity, luminescence, chirality, magnetism electro-activity, catalysis, etc … In addition, these functionalities can be rather easily modulated by changing the host structure as well as the inserted species. Such “Lego©” chemistry seems really appropriate and we obtained many magnetic (2D-3D), magneto-luminescent and magneto-electric systems.1,2 Although successful, this approach is still quite serendipitous and a better control *a priori* of the synthesis and precise knowledge of the structure of these hybrid materials are necessary to help the designing of new layered hybrids.

We present here recent results concerning magnetic and multifunctional layered hydroxides (LSH) and oxides (Aurivillius phases) illustrating the mechanisms involved in insertion-grafting reactions, up to exfoliation. Our results enlarge the library of molecular species that is possible to graft into inter-lamellar space using various activation conditions.2–5 We will describe efficient structural characterization techniques and analytical tools (TEM, XRD analysis and modeling) that were developed to investigate the structural features of these systems, allowing for establishing structure-properties relationships, together with improvement of the design of layered functional materials.

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