Chemical Synthesis of inorganic nanomagnets

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Abstract

Metallic nanoparticles and nanohybrids will initiate important development in nanotechnologies due to their specific chemical and physical properties (*i.e.* in catalysis, magnetism, optics, etc) and new development in sustainable energy (*i.e.* fuel cells). It is now well known that these properties are mainly controlled by the fine tuning of structural parameters such as the size, shape, crystallinity and composition. In order to study these specific properties, a wide variety of both chemical and physical routes have been developed for the synthesis. In particular, one of the specific challenges in the synthesis is to control and to characterize the nanohybrids at the nanometer scale. Concerning their fabrication, the chemical bottom up approach, is ideal to design this specific class of nanomaterials due to its versatility, facility and low cost. In the following, we review some of the most classical chemical routes to produce such nanohybrids focusing on the case on cobalt and Co-Pt nanomagnets. We discuss the concepts of nucleation and growth for such objects and their consequence on their structural properties (size, shape, composition, ordering...).

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