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FUNCTIONAL MOLECULAR NANOMATERIALS : MAGETIC AND PHOTOMAGNETIC BEHAVIOR

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Nanoparticles based on coordination networks have been reported for the first time less than a decade ago on Prussian blue analogs,[1] and more recently on other networks opening the perspectives for the synthesis of new functional nano-objects.[2] One of the aims in this fast developing area is the use of the richness (structural and electronic) and the flexibility of coordination complexes to tailor the properties of new objects. New materials can thus be elaborated where the properties of the molecules that serve as a building block contribute to create functionalities at the nanoscale. Electron transfer, spin transition and luminescence are among the physical properties of coordination complexes that can be gathered in one nano-object creating a given function.[3]

The field of coordination networks is vast, we will focus on cyanide-bridged systems and particularly on two different families that present suerparamegnetic and photomagnetic behaviors. We show how the synthetic strategy that allows to elaborate nanoparticles with a well define size leads, on one hand, to a tuning of the blocking temperature of the particles.[4] On the other hand, we demonstrate the potential of these coordination particles to create new functionalities by the association of different properties within a single nano-object.[5]