

Photomagnetic Mixed-Valence Compounds : Molecules and Nanoparticules

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The photomagnetism in molecular compounds is today a very active field of research, since the photocontrol of magnetic properties at the molecular scale opens new perspectives in information storage. The photomagnetic properties in molecular bimetallic compounds have been discovered in Japan in 1996 by the group of Professor Hashimoto [1]. The first studies have concerned mixed-valence FeCo prussian blue analogs where the photomagnetic effect is based on Charge Transfer Induced Spin State Transition in extended networks [2]. Later, other mixed-valence extended networks and molecules built from octacyanometalalates have been revealed as other efficient photomagnetic systems [3,4].

Recently, we have started a systematic study of photo-induced magnetization in cyanometallates compounds due to an electron transfer mechanism. In this presentation, we will focus on recent results we have obtained, and two different types of materials will be presented: (i) molecular clusters [5], and (ii) nanoparticles [6]. A particular attention will be devoted to the comparison with the photomagnetic behaviors of nano-sized systems with those obtained for same materials at the microscopic scale.

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