

Cyanido-Bridged Fe/Co Pairs: How to Make Them and How to Study the Switching Mechanism with XAS and XMCD Spectroscopies

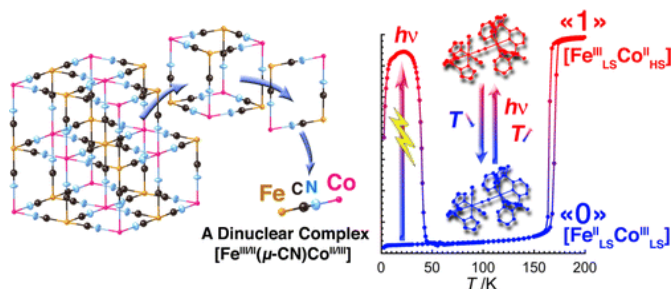
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The rational design of molecular systems, which exhibit switchable physical properties as a function of external stimuli (T , E or H , $h\nu$, P , etc.) is a subject of the intense research activity to conceive high-performance molecule-based electronic devices [1-2]. Over the past decade, chemists have investigated the synthesis of magnetic and photoresponsive complexes through rational choices of cyanido-based building blocks. This approach has been extremely successful, and various molecular architectures have been obtained with remarkable properties such as spin crossover, [3] electron-transfer process [4-5], and photoinduced magnetism [6].

In our quest to obtain new molecular systems and concomitantly to reduce the size of these functional molecules, we designed dinuclear complexes using a building block strategy. Some of them are exhibiting switchable optical and magnetic properties in solution and/or in solid state [7-8].

In the second part of this presentation, the thermally and light induced electron transfer of the dinuclear complex $[(\text{Tp})\text{Fe}^{\text{III}}(\text{CN})_3\text{Co}^{\text{II}}(\text{PY5Me}_2)]^+$ ($\text{PY5Me}_2 = 2,6\text{-bis}(1,1\text{-bis}(2\text{-pyridyl)ethyl)pyridine}$; $\text{Tp} = \text{hydridotris}(\text{pyrazol-1-yl})\text{borate}$), has



been studied using a combination of bulk structural, spectroscopic, magnetic and photomagnetic studies. Moreover, the switching mechanism followed at the local level by X-ray Absorption Spectroscopy (XAS) and X-ray Magnetic Circular Dichroism (XMCD) measurements at Fe and Co $L_{2,3}$ edges will be presented [9].

References

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