Stimuli-responsive magnetic materials and spintronic devices based on molecules

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Responsive materials for which physical or chemical properties can be tuned by applying an external stimulus are attracting considerable interest in materials science. This kind of materials may be viewed as a new generation of multifunctional materials in which two (or more) functional properties are not simply co-existing in the same material but strongly coupled to guaranty its response to the external stimulus. A source of stimuli-driven materials results from the construction of hybrid solids formed by inserting a responsive molecule into a functional network. In this last case the structural or electronic changes induced in the responsive molecule by the applied stimulus can result in a change in the structure and properties of the functional network. Here I will illustrate in the first part how this molecular approach can be used to design a new generation of smart materials in which their magnetic properties can be tuned by applying an external stimulus. As responsive molecule I will use spin-crossover complexes and photo-switchable molecules. In the second part I will show how in an OLED the emission of light can be tuned by applying a magnetic field.

References

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