From Molecules to Materials: towards multifunctional switchable systems

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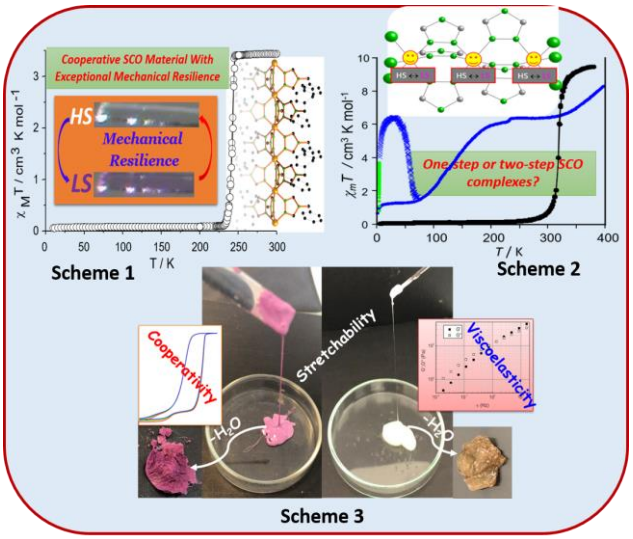
Abstract

Among the molecular switchable materials, the spin crossover (SCO) complexes are of particular interest, notably because of their potential applications in the development of new generations of electronic devices such as memory, molecular sensing and displays.[1-5] Among the few systems exhibiting remarkable SCO behavior, the systems based on the 1,2,4-triazole ligands still remain among the most promising materials for future electronic devices since some of them display wide hysteresis loops around room temperature. However, the major lack of high quality single crystals with complete structural data for those materials prevent any deep magneto-structural correlations which are essential to understand and fine tune their SCO properties by acting of their cooperativity.

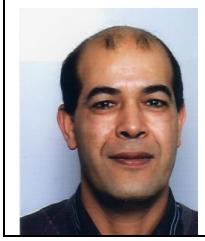
In this contribution we report a new 1D triazole-based SCO Fe^{II} material allowing single crystal investigations in both high- and low-spin states (**Scheme 1**);[1] the first series of triazole-based SCO Fe^{II} trinuclear complexes (**Scheme 2**).[2] and some unconventional viscoelastic cooperative SCO composite materials (**Scheme 3**). Their SCO characteristics (magnetic behaviours, cooperativity and mechanical resilience) and their mechanical properties will be discussed according to their molecular and inter-molecular structural parameters.



Recent Publications (maximum 5)

1. Pittala N., Thétiot F., Triki S., Boukheddaden K., Chastanet G., Marchivie M., *Chem. Mater.* 29 (2017) 490.
2. Pittala N., Thétiot F., Charles C., Triki S., Boukheddaden K., Chastanet G., Marchivie M., *Chem. Commun.* 53 (2017) 8356.
3. Mekuimemba C. D., Conan F., Mota A.-J., Palacios M.-A., Colacio E., Triki S., *Inorg. Chem.* 57 (2018) 2184–2192.
4. Nebbali K., Mekuimemba C. D., Charles C., Yefsah S., Chastanet G., Mota A. J., Colacio E., Triki S., *Inorg. Chem.* 57 (2018) 12338.
5. Benaicha B., Van Do K., Yangui A., Pittala N., Lusson A., Sy M., Bouchez G., Fourati H., Gómez-García C. J., Triki S., Boukheddaden K., *Chem. Sci.* (2019) doi. 10.1039/C9SC02331C.

Biography



Smail TRIKI is a Professor of Chemistry at the University of Brest and Head of "Switchable and Polyfunctional Materials" Group (UMR CNRS 6521) at the same university. His research work is located the field of molecular chemistry, including design and syntheses, and covers certain aspects of material sciences, such as magnetic, switchable, luminescent materials, including multifunctional systems. He published more than 130 papers (see details in: https://scholar.google.fr/citations?user=o6aDuqU5uKoC&hl=fr&oi=ao). His H-index is 33 with more than 3400 citations (web of science, April 2019).

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