

Smart Molecular Materials: Synthesis, Structure and Properties**Helena Shepherd***University of Kent, Canterbury, United Kingdom;**h.j.shepherd@kent.ac.uk*

Molecules that change their colour, structure, and electronic properties in response to an external stimulus represent an emerging class of 'smart' material with potential applications in sensing, actuating and responsive technologies. The spin crossover (SCO) phenomenon leads to a redistribution of electrons within the d-orbitals of some transition metal complexes as a result of an external perturbation such as changes in temperature, pressure changes and light irradiation. The transition between high spin and low spin states involves a significant change in molecular volume and is often cooperative in crystalline materials, leading to dramatic changes in the optical, mechanical and magnetic properties.

We have demonstrated the use of mechanochemistry in the synthesis of SCO materials,¹ and have recently shown that they can be synthesised through contact of the reagents in the solid state without any applied mechanical force.² Recent work in our group has shown the significant promise of using supramolecular interactions to design new SCO materials with tunable thermally-responsive properties.³ This talk will focus on how various stimuli can affect the synthesis, structure and properties of these SCO materials in the solid state.

Keywords: Switchable molecular materials