MS39-1-4 Multiscale characterization of spin crossover complexes
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Abstract
Spin CrossOver (SCO) complexes are a family of materials displaying two stable electronic configurations (low spin and high spin), that can be reversibly tuned using appropriate stimuli (temperature, pressure, light irradiation, magnetic field etc…). In bulk materials, the switching properties are also highly dependent on the crystal packing and the interactions between complexes[1]. SCO transition metal complexes have been proposed to be employed in molecular electronic and in multifunctional spintronic devices. The assembly of SCO complexes on a solid support is the fundamental first step before any device fabrication: for this scope high-vacuum sublimation deposition allows obtaining high quality nanometric films, with a good control of the final thickness[2]. In nanostructured SCO thin films, due to the fragile nature of the spin transition involved (both in terms of stability of the molecules and of robustness of the SCO process to external constraints), it is often observed that the interaction with the surface can bring the system in a total or a partial loss of SCO properties. This may originate from a strong interaction with the substrate[3] or a partial degradation of the molecular structure[4]. We will present the study of two Fe(II) SCO complexes, first in bulk (powder and single crystals) to establish structure-properties relationships, then in ultra thin films evaporated on Si(100) and on polycristalline metallic substrates (Au, Ag). The structure and morphology of the ultra thin films were investigated by AFM imaging, X-Ray Reflectometry and Grazing Incidence X-ray Diffraction (GIXRD).

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