IN SITU X-RAY DIFFRACTION STUDIES OF NANOPOROUS SPIN CROSSOVER FRAMEWORKS

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INTRODUCTION

The targeted development of functional metal-organic frameworks, is not only a synthetic challenge, but requires parallel characterization of their often complex structure-property relationships. Among strategic efforts to introduce specific function, the incorporation of spin crossover switching centers allows for the development of new advanced functional materials for molecular-scale electronic switching and sensing devices. Recent work has shown that such spin crossover framework materials (SCOFs) can incorporate an additional level of functionality associated with their often porous natures; guest sorption/desorption in such systems, and the associated perturbation of the iron(II) coordination environment and framework structure, provide a unique avenue for investigating the spin crossover phenomenon in the solid state.

RESULTS

To this end we have developed in situ synchrotron-based powder X-ray diffraction methods to simultaneously probe their guest-dependent structural and magnetic properties.