

Spin Crossover in Solvates of an Iron(II) Complex with Solvent Mixtures

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Recently it has been shown that the family of crystalline alcohol solvates of $[\text{Fe}^{\text{II}}(2\text{-pic})_3]\text{Cl}_2$ display a range of spin transition scenarios: two-step transitions with and without hysteresis (2-propanol and ethanol), continuous transitions (methanol, 2-butanol) as well as the absence of any spin crossover (1-propanol, *tert*-butanol) [1]. These findings raise the question about the properties of solvates crystallized from *mixtures* of two alcohols. We present the structures and magnetic properties of three such mixed solvates of $[\text{Fe}^{\text{II}}(2\text{-pic})_3]\text{Cl}_2$ as obtained from diffraction and SQUID measurements. The mixed 1-propanol:2-propanol and ethanol:2-propanol solvates show continuous spin transitions, while the methanol:ethanol mixture shows a two-step transition.

The thermal and positional disorder of the solvent molecules is found to be coupled with the spin conversion of the bi-stable $[\text{Fe}^{\text{II}}(2\text{-pic})_3]$ complex, an observation which will also be discussed theoretically.

[1] Hostettler M., et al., *Angew. Chem. Int. Ed.*, 2004, **43**, n.35, 4589.

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