

Cooperative Spin Transition in Fe (II) Dinuclear Triple Stranded Helicates.

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Multinuclear spin crossover complexes are more interesting than mono nuclear complexes¹ as the change in magnetic property in those cases are more prominent.² With that thought in mind we prepared some ligands which can produce binuclear complexes (Figure 1). The complexes are characterized by single crystal XRD and magnetic susceptibility measurements. The ligand was designed so that there is some separation between the chelating sites, so the chelating sites are separated by spacer. Three ligands wrap two metal centers in helical fashion. The free NH₂ moiety helps in forming hydrogen bonding in the solid state packing. This hydrogen bonding can give rise to cooperativity among the metal centers. The crystal structure is shown in figure 2. Four perchlorate counter anion is balancing the charge of the complex.

The magnetic data reveals a transition from LS-LS to HS-HS for this binuclear system. The spin transition is happening through spin admixed state as can be seen the rise in magnetic moment is gradual and stepped rather than abrupt which is found in most of the cases.

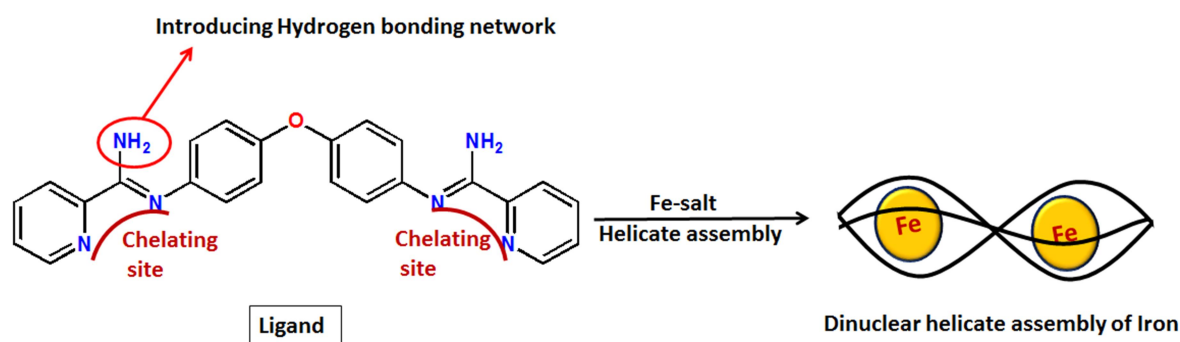


Figure 1. Drawing of the ligand and synthetic strategy

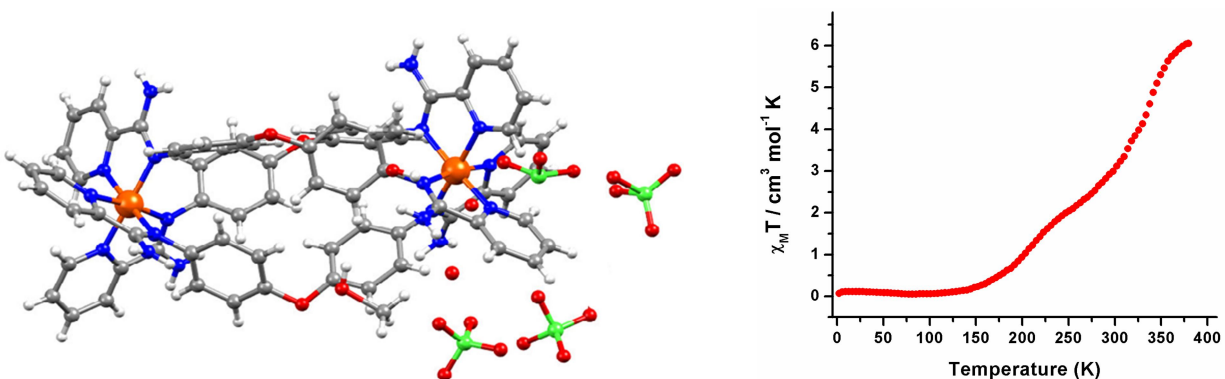


Figure 2. Crystal structure of complex 1 (left) and magnetic data (right)

References.

1. Azzedine Bousseksou, Gábor Molnár, José Antonio Real, Koichiro Tanaka, *Coord. Chem. Rev.*, **2007**, *251*, 1822-1833
2. Rossana J Archer, Hayley S Scott, Matthew I J Polson, Bryce E Williamson, Corine Mathoniere, Mathieu Rouziers, Rodolphe Clérac, Paul E. Kruger, *Dalton Trans.*, **2018**, *47*, 7965–7974