

ABSTRACT

Triethanolamine (TEA) behaves as a tri (N,O,O') or tetradentate (N,O,O',O") ligand. It is an affluent oxygen and nitrogen donor ligand, which has been used to construct one, two and three dimensional metal organic frameworks with different representative metals, transition metals and lanthanides. It has diverse binding modes depending upon the metal's geometry. The ethanol groups of the TEA contain three hydroxyl protons that may dissociate. The deprotonation of TEA assist the formation of anionic metal complexes. In its case, the coordinated alkoxide groups may further form additional bonds through the oxygen bridges to give polynuclear complexes. Keeping in mind these properties of triethanolamine, efforts were made to form polynuclear metal complexes of Fe III and alkaline earth metals. These complexes were synthesized in mixture of methanol and acetonitrile. The X-ray diffraction, FT-IR, thermogravimetric and differential scanning calorimetric studies were carried out. The complex formed was a "mixed valent hepta-nuclear iron wheel", which showed the behavior of SMM but only below 2K. The arrangement in such a heptanuclear structure can be looked upon as a ring consisting of an even number of iron ions with an extra iron ion in the center. Such odd numbered iron complexes are rare. These iron(III) complexes are attention-grabbing not only from a chemical and structural viewpoint but also because explication of their magnetic properties and spin topologies would help in comprehending the magnetic properties of larger ferric systems.