Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Internal Seminar

Phosphonate, Phosphinate and Phosphate based Lanthanide Complexes and their Magnetic studies

Junaid Ali

TIFR, Hyderabad

The molecular complexes showing magnetic bistability below certain blocking temperatures (Tb) are reported as single-molecule magnets. These magnetic materials have proven to be valuable assets in a wide spectrum of useful materials like storage devices, magneto-optical switches, molecular spintronics etc. Since the discovery of first single-molecule magnet (Mn12-OAc) by Sessoli et al. in 1993, a number of 3d, 4f and mixed 3d-4f complexes, have been reported as SMMs. These complexes have been synthesised employing a wide range of ligands like β-diketonates, calixarenes, Schiff bases, alkoxides, carboxylates, amino acids etc. The performance of lanthanide based complexes as SMMs has been found to be much better than transition metal complexes. Owing to poor solubility of lanthanide phosphonate and phosphate complexes, the reports of such complexes are very slim in literature. We have employed sterically hindered phosphonic, phosphinic acid and phosphate ligands and isolated a series of soluble complexes, structurally characterised them by single crystal x-ray diffraction studies and explored their magnetic properties. The synthesis, spectroscopic characterisation and their magnetic studies will be discussed in detail.

Monday, Jul 10th 2023

11:30 AM

Seminar Hall, TIFRH