

Internal Seminar

Lanthanide Phosphonates and Phosphates: Synthesis, Structural Characterisation and their Magnetic Studies

Junaid Ali

TIFR, Hyderabad

Phosphonate and phosphate ligands have historically received less attention when compared to the widely prevalent carboxylate ligand system. Phosphonates possess multiple donating sites, often leading to the formation of larger aggregates with limited solubility. Conversely, the P–O bond within phosphates is highly susceptible to hydrolysis, resulting in the precipitation of insoluble compounds, particularly when interacting with lanthanide metal ions. However, over the past few decades, various synthetic approaches have emerged for the preparation and characterisation of lanthanide complexes involving both phosphonate and phosphate ligands. Consequently, researchers have delved into exploring the magnetic properties of these complexes, such as their potential as single molecule magnets (SMMs) and their ability to exhibit a magnetocaloric effect (MCE). We have employed sterically hindered organo-phosphonic acids and organo-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.

Thursday, Jun 27th 2024

14:30 Hrs

Seminar Hall, TIFR-H