

ABSTRACT

In this work pyridine-2, 6-dicarboxylic acid and triethanolamine were used as ligands to design, synthesize and characterize metal-organic complexes of the *d* and *f*-block metals. From the synthetic point of view, multi-carboxylate and related ligands represent useful tools in the synthesis of lanthanide-metal organic frameworks, whereas, transition metal complexes with nitrogen donors has received much attention in recent years on account of their rational design and synthesis in coordination chemistry. Pyridine-2, 6-dicarboxylic acid (H₂PDA) reacted with SmCl₃. xH₂O in the presence of auxiliary ligand (formic acid) under hydrothermal conditions to form a novel lanthanide-organic framework [C₁₂H₁₇Sm₁N₂O₁₆](1). Complex 1 crystallizes in monoclinic system; space group *P*2₁/*c*. Sm³⁺ ion has distorted triangular dodecahedron coordination geometry. While the self-assembly of triethanolamine with CuCl₂.2H₂O in the presence of co-ligands (sodium azide and sodium benzoate) in methanol produced [Cu(H₂tea)(N₃)](2). Complex 2 crystallizes in monoclinic system, space group *P*2₁/*n*. Furthermore, the mononuclear units are held together by O—H...O intermolecular hydrogen bonds forming a polynuclear network. Both the complexes were characterized by IR spectroscopy.