

ABSTRACT

Metal complexes / Metal organic frameworks are being paid extensive attention not only due to their intriguing frameworks but also because of their potential applications as functional materials and their usage in storage, purification and separation of gases. Moreover, they are widely used as catalyst, molecular magnets, luminescent materials, optoelectronic devices, electrical conductors and as therapeutic agents in medicine.

Powder and crystalline Metal Organic Frameworks / Metal complexes were successfully synthesized under reflux & hydrothermal conditions using various Transition & Lanthanide metal salts with *N*-donor ligand. 1, 10-phenanthroline was used as ligand in the presence of 4, 4'-biphenyl dicarboxylic acid and oxalic acid as co-ligand. The biological and antioxidant potential of synthesized compounds was estimated by various antioxidant and antibacterial activities.

The solubility of these compounds was checked in various solvents and melting points were also recorded. For characterization and structure elucidation various techniques such as powder X-ray diffraction, FTIR, and UV/visible spectroscopy were employed. To determine the antioxidant potential of synthesized compounds, prooxidant chelation, free radical scavenging and prooxidant reduction methods were employed. Antibacterial potential of these compounds was evaluated by Disc diffusion method against gram positive (*Bacillus anthracis* & *Bacillus subtilis*) and gram negative bacteria (*Escherichia coli* & *Pseudomonas aeruginosa*). Result of this activity exhibited that some Metal organic frameworks / Metal Complexes are highly active against specific strains even at low concentrations.