



ABSTRACT

Metal Organic Frameworks / Metal complexes are gaining significance importance and attention in these days. They show numerous uses like storage, purification and separation of gases. The catalysis, magnetism, nonlinear optics and the biological applications of MOFs are also of great interest.

Powder and crystalline Metal Organic Frameworks / Metal complexes were successfully synthesized under reflux & hydrothermal conditions using various Transition & Lanthanide metal salts with *N*- and *-O* donor ligands. 4, 4'-biphenyl dicarboxylic acid, and 2, 2'-bipyridine were used as ligands in the presence of ethylene glycol as co-ligand. The biological potential of the compounds synthesized was assessed by antioxidant and antibacterial activities.

The solubility of these compounds was checked in various solvents and melting points were also recorded. Various techniques such as powder X-ray diffraction, FTIR, and UV/ visible spectroscopy were employed for structure elucidation. To estimate antioxidant potential of the compounds, three different approaches i.e., Prooxidant chelation, free radical scavenging and prooxidant reduction were employed. These complexes were also screened for antibacterial activity against gram positive (*Bacillus anthracis* & *Bacillus subtilis*) and gram negative bacteria (*Escherichia coli* & *Pseudomonas aeruginosa*). Some metal organic frameworks / Metal Complexes exhibited excellent antibacterial activity against specific strains even at low concentrations.