

Abstract

Metal complexes illustrated many interesting properties, which find diverse applications in many aspects of human life such as medicine, polymerization and catalysis. Cobalt and gadolinium metal complexes with trans- 1, 2- diaminocyclohexane-N-tetraacetic acid had been synthesized by solvothermal and reflux methods at 180° C. The synthesis of metal complexes is affected by different factors like pH, temperature, solvents and mole ratio. The spectroscopic characterization made by Fourier transforms infrared (FTIR) and Elemental analysis. Photocatalytic activity of different complexes was performed against methylene blue the exposure of sunlight through UV-visible spectrophotometer. The results demonstrated that methylene blue was degraded by above synthesized complexes so, these complexes have high prospective for degradation of pollutants. The physio-chemical data suggested that these complexes are thermally stable and slightly soluble in water. The cobalt complexes exhibited antimicrobial activity against gram-negative bacteria *Bacillus subtilis* so, these are biologically active.

Keywords: 1, 2-diaminocyclohexane-N-tetraacetic acid, Cobalt and gadolinium complexes, Degradation of methylene blue, Antimicrobial activity with *Bacillus subtilis*