

Abstract

Reaction of an aliphatic dicarboxylic acid, e.g. itaconic acid with transition metal ions have been investigated under different reaction conditions. When the reaction of equimolar amount of CuCl_2 and itaconic acid was carried out in presence of excess of pyridine, a binuclear copper carboxylate complex, $[\text{Cu}_2(\text{OH})_2(\text{ITA})(\text{py})_2(\text{H}_2\text{O})]$ is formed. The reaction of CuCl_2 with itaconic acid was also performed in presence of another potentially bridging ligand, 4,4'-bipyridine in an attempt to isolate 3-dimensional carboxylate bridge polymeric assemblies. Although this reaction was performed in presence of a base, the isolated product turned out to be $[\text{Cu}(4,4'\text{-bpy})_2\text{Cl}_2]$ which is devoid of any carboxylate ligand. When the reaction of CuCl_2 with itaconic acid was performed under solvothermal condition in dimethyl formamide medium, a polymeric material without any chloride is isolated in single crystalline form.

Furthermore, a potentially pentadentate ligand with N_3S_2 coordination environment is prepared and its complexation with $\text{Zn}(\text{II})$ was carried out. The reaction of $\text{Zn}(\text{II})$ with the N_3S_2 ligand, DAPSH yielded a dimeric species, with no labile coordination sites available for further bridging. Studies of the photoluminescent characteristics of compound **5** showed that when excited in the ultraviolet region, it emits highly intense and sharp red light. If such luminescent motif can be integrated into polymeric frameworks, the resulting material can be used for devising sensors, displays etc.