

Abstract

The synthesis and characterization of cadmium complexes with 4-pyridine carboxylic acid known as isonicotinic acid were studied. Isonicotinic acid has two binding sites. It can coordinate with metal from oxygen of carboxylic acid and nitrogen of the ring. Therefore it is considered as a versatile ligand. Three bimetallic complexes of cadmium and zinc with isonicotinic acid have been synthesized and characterized for their structural studies. Complex 1, complex 2 and complex 3 were synthesized by hydrothermal, reflux and sonication methods respectively. All the three complexes were found to be very stable. They are insoluble in various solvents at room temperature and were dissolved on sonication with heating for two hours. FT-IR spectral studies have shown shifts in the peaks for all three complexes which shows that metal had bonded to the ligand. Complex 1 shows peaks 3350-3600 cm^{-1} for OH bond which indicate the coordination of O-H bond and it shows peaks at 1613 cm^{-1} and 1417 cm^{-1} for C=O and 866 cm^{-1} and 826 cm^{-1} and 1652-1613 cm^{-1} for C-N and C=N showing the coordination of nitrogen of the ring. For complex 2 broad peak 3224-3084 cm^{-1} assigned to water molecule and 1651-1613 cm^{-1} for C=O and 983-910 cm^{-1} and 1581-1539 cm^{-1} for C-N and C=N. Moreover, C-H stretch in the ring is seen at 772 and for C=C peaks appeared at 1651-1613 cm^{-1} . For complex 3, peaks for water molecule observed at 3229 cm^{-1} . For C=O, peaks were seen at 1585-1541 cm^{-1} and for C=N peaks were observed at 1499-1417 cm^{-1} . Peaks at 772-705 cm^{-1} were observed for C-H stretch. All the three complexes were also characterized atomic absorption spectral studies. Both metals were detected in the complexes by AAS. UV-vis studies showed absorption at 520 nm. All the three complexes had shown fluorescence in DMF and methyl alcohol. No photocatalytic activity was observed for methylene blue by complexes formed.