ABSTRACT

The present work describes the coordination behavior of Benzene-1,3,5-tricarboxylic acid (Tri A) as a ligand while pyridine-2,6-dicarboxylic acid as co-ligand with neodymium and zinc under reflux and hydrothermal methods by using different metals salts. [Nd(Tri A), (PDA-2,6) H_2O.THF]. **(1)** was synthesized by reflux method. Neodymium is six coordinated by two oxygen atoms [O(15), O(16)] from one Tri A ring and two oxygen atoms [O(25) and O(26)] from PDA-2,6 in a conventional *O,O'*-bidentate fashion and one oxygen atom from Tetrahydofuran and one oxygen atom from water molecule. [Zn(Tri A)$_2$ H_2O].(H_2O)$_8$ **(2)** was synthesized by reflux method. Zinc is six coordinated by five oxygen atoms [O(10), O(12), O(24) and O(26)] from two Tri A rings in a conventional *O,O'*-bidentate fashion and one oxygen atom from one water molecule and one nitrogen atom from azide molecule. In [Zn(Tri A)$_2$ H_2O)$_2$].(H_2O)$_8$ was synthesized by hydrothermal method. Zinc is six coordinated by four oxygen atoms [O(16), O(17), O(32) and O(33)] from two Tri A rings in a conventional *O,O'*-bidentate fashion and two oxygen atoms from two water molecules. [Nd(Tri A)$_2$ H_2O)(N_3)]. **(4)** Was prepared by hydrothermal method. Neodymium is six coordinated by four oxygen atoms [O(10), O(11), O(25) and O(26)] from two Tri A rings in a conventional *O,O'*-bidentate fashion and one oxygen atom from one water molecule and one nitrogen from azide. Results of CHNS analysis have been in good agreement with the proposed structures while FT-IR spectroscopy also supports the binding of ligand with metal. Photo catalytic activity of complexes was also studied by using methylene blue dye. Temperature dependent zinc metal-organic gel (MOG) behavior was also studied.

Keywords: Benzene-1,3,5-tricarboxylic acid, Neodymium and Zinc, Co-ligand, Hydrothermal, Reflux method, Photocatalytic activity, Metal-Organic gel (MOG).