Design, synthesis, characterization and photoluminescence studies of two new coordination polymers based on 4,4′-oxybis(benzoic acid) and N-donor ligand with transition metals

S. Shibu Prasad[a], M.R. Sudarsanakumar[a*], V.S. Dhanya[a], S. Suma[b], M.R. Prathapachandra Kurup[c]

[a]Department of Chemistry, Mahatma Gandhi College, University of Kerala, Thiruvananthapuram 695 004, Kerala, India
[b]Department of Chemistry, Sree Narayana College, University of Kerala, Chempazhanthy, Thiruvananthapuram 695 587, Kerala, India
[c]Department of Chemistry, School of Physical Sciences, Central University of Kerala, Riverside Transit Campus, Padenakad, Nileshwar, 671 314, Kerala, India

ABSTRACT

Two novel one dimensional coordination polymers of cobalt and copper with 4,4′-oxybis(benzoic acid) (H_2OBA) and N-donor ligand-1H-imidazole (IM), $[Co(OBA)(IM)_2(H_2O)]_n$ (**1**) and $\{[Cu_2(OBA)_2(IM)_3(H_2O)_2].5H_2O\}_n$ (**2**) have been prepared by single gel diffusion technique at ambient condition using sodium metasilicate. Single crystal X-ray diffraction studies reveal that both **1** and **2** belong to the triclinic space group $P\bar{1}$. The grown crystals were further characterized by elemental analysis, powder X-ray diffraction studies, thermogravimetry, FT-IR and UV-visible spectral studies. The compound **2** possesses two different types of coordination environments around Cu(II) ions - Cu1 is five coordinated (distorted square pyramidal) and Cu2 is six coordinated (distorted octahedral). The two dimensional structures of both **1** and **2** formed as a result of hydrogen bonding and π–π interactions possess nanopores. Photoluminescence studies were also carried out.

*Corresponding author: Department of Chemistry, Mahatma Gandhi College, Thiruvananthapuram 695 004, University of Kerala, India. Tel: +91 471 2592617
E -mail address: sudarsanmr@gmail.com (M.R. Sudarsanakumar)