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Title: Use of Fluorescent Bi-functional Linkers in Making Metal Organic Coordination Networks

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Abstract: Perylene-3,4,9,10-tetracarboxylic dianhydride (PTCDA) is employed to synthesize four bifunctional fluorescent linkers (L1-L4) by reacting it with amino acids, such as L-Alanine, L-Phenylalanine, L-Tyrosine and L-Glutamic acid, respectively. All four linkers are characterized by FTIR, ¹H NMR, circular dichroism and fluorescence spectroscopy, thermogravimetric analysis (TGA) and powder X-ray diffractometry. Metal complexes (1-16) were prepared for different ratios (1:1 or 1:2) of transition metal ions, such as Cu²⁺, Ni²⁺, Cd²⁺ and Zn²⁺, and one of the linkers. All metal complexes are characterized by elemental analysis, FTIR, circular dichroism and fluorescence spectroscopy, TGA and powder X-ray diffractometry. TGA shows that linkers as well as the complexes are thermally stable up to 300 °C. PXRD patterns strongly suggest their isostructural nature, although being low in intensity hinting at limited crystalline nature. These frameworks can have various non-covalent interactions, like hydrogen bonding, π-π interactions, etc., along with coordination bonds to form supramolecular coordination networks. These type of metal organic coordination networks (MOCNs) have inherent fluorescent property and therefore are tested for photoluminescence based sensing applications, with quenching phenomenon being predominant in the solution state.


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