Designing coordination polymer based metallogels

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Coordination Polymers (CPs) are a new class of crystalline solids and have attracted much attention owing to their potential applications in a variety of areas, including gas storage, separations, heterogeneous catalysis, and biochemical applications. Coordination polymer based metallogels are special class of supramolecular gels wherein metal-ligand coordination bonds play crucial role in gelation. It has been reported that coordination polymers having lattice occluded solvents have higher tendency to form gel. In this report, we would like to present a series of coordination polymers derived from a bis-pyridyl ligand namely (1,1’-(oxybis(4,1-phenylene))bis(3-(pyridin-3-yl)urea), (LP6) and various transition metal ions (Zn(II), Cu(II) and Ag(II)). The coordination polymers were characterised by Single Crystal X-ray Diffraction, Powder X-ray diffraction, Thermogravimetric analysis, Elemental analysis and FT-IR. Most of the coordination polymers were found to contain lattice occluded solvents and many of them showed metallogelation. Structure property correlation studies suggested that the molecular structure of the coordination polymers and the gel network were very similar. All the gels were characterised by Rheology, Transmission Electron Microscopy (TEM) and Scanning Electron Microscopy (SEM). Thixotropic behaviour and sensing ability of hazardous gases like NH3, H2S of some of the metallogels were studied. Some of the coordination polymers showed reasonable cytotoxicity (MTT assay) and could be used for cell imaging of a macrophage cell line RAW 264.7.


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