

Linker directed structural diversity and magnetochemistry of Mn(II) coordination polymers

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The rational design and synthesis of new coordination polymers (CPs) and related materials have spawned considerable attention, not only because of their intriguing structural and topological diversities,¹ but also because of their various potential applications as functional materials, such as in gas adsorption, catalysis, molecular recognition, optics, embedding of nano-particles and magnetics.² In contrast to the CPs with mononuclear connected nodes, those containing bimetallic units have attracted much attention, as they offer the opportunity to investigate close metal-metal interactions, which are associated with magnetic properties. Carboxylate-bridged manganese coordination polymers (CPs) are well recognized in the field of molecular magnetism as manganese compounds possess large numbers of unpaired electrons and show paramagnetism in various oxidation states as well as magnetic interactions transmitted through carboxylate bridges are usually weak. In continuation of our efforts,³ for understanding the influence of different N-donor auxiliary ligands on the self-assembly and structures of coordination polymers (CPs), six new Mn(II) based coordination polymers have been rationally designed and synthesized by the combination of a bent dicarboxylic acid (H₂L), Mn(OAc)₂, and a series of N-donor co-ligands. The single crystal structure analysis reveals the role of the N-donor ligands for providing diversity in crystal engineering of these CPs correlating with their shape and size differences. Furthermore, their magnetic properties have been investigated to help us tentatively describe their structure-property relationships.

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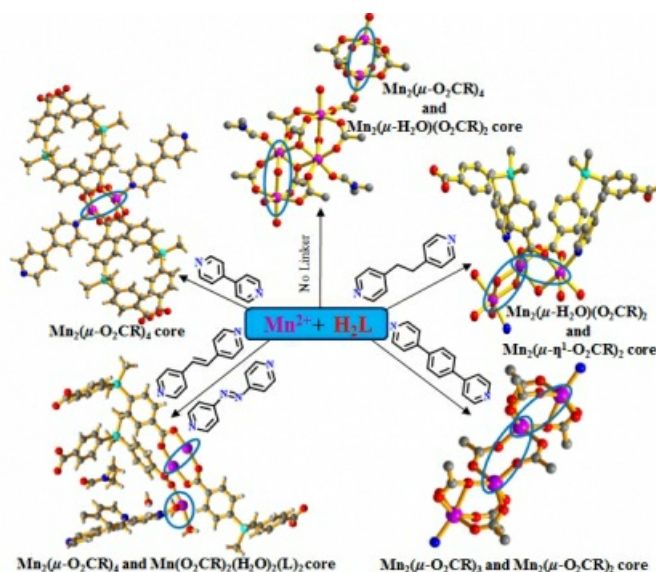


Figure. Different dimetallic core types found in 1-6, where H₂L = 4,4'-(dimethylsilanediyl)dibenzoic acid

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