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Title:	Structural Diversity of Mn(II) Complexes with Acetylene Dicarboxylate and Hexadentate Ancillary Ligands under Ambient Conditions: Effect of Methylene Chain Length on Coordination Architectures
Authors:	Khullar, S. (/jspui/browse?type=author&value=Khullar%2C+S.) Mandal, S.K. (/jspui/browse?type=author&value=Mandal%2C+S.K.)
Keywords:	Polypyridyl Chemistry Hexadentate
Issue Date:	2013
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Citation:	Crystal Growth and Design, 13(7), pp.3116-3125.
Abstract:	<p>For Mn(II)-adc (adc = acetylene dicarboxylate) chemistry, diversity of product formation is demonstrated with five similar hexadentate polypyridyl ancillary ligands differing in methylene chain lengths between the alkyl nitrogens, such as tpen (N,N,N',N'-tetrakis-(2-pyridylmethyl)-1,2-diaminoethane), 1,2-tpn (N,N,N',N'-tetrakis-(2-pyridylmethyl)-1,2-diaminopropane), tppn (N,N,N',N'-tetrakis-(2-pyridylmethyl)-1,3-diaminopropane), tpbn (N,N',N'',N'''-tetrakis-(2-pyridylmethyl)-1,4-diaminobutane), and tppen (N,N',N'',N'''-tetrakis-(2-pyridylmethyl)-1,5-diaminopentane). Five new compounds, [Mn2(adcd)(tpbn)(H2O)2]·2(solvent)<sub>n</sub> (solvent = H2O, 1a; solvent = CH3OH, 1b), [Mn2(tppn)(H2O)6](adc)2·3H2O (2), [Mn2(adcd)(1,2-tpn)2](ClO4)2·2(solvent) (solvent = H2O, 3a; solvent = CH3CN, 3b), [Mn2(adcd)(tpen)2](ClO4)2·2(solvent) (solvent = H2O, 4a; solvent = CH3CN, 4b), and {[Mn2(adcd)(tppen)(H2O)4](adc)·4H2O}<sub>n</sub> (5), have been isolated in good yields from the self-assembly reactions of raw materials at ambient conditions and structurally characterized by elemental analysis, IR and Raman spectroscopy, ESI mass spectrometry, single crystal and powder X-ray diffraction, and thermogravimetric analysis. Compound 1b with hexacoordinated Mn(II) centers is a three-dimensional (3D) metal-organic coordination network (MOCN) held together by strong hydrogen bonding and π-π interactions. Compound 2 with hexacoordinated Mn(II) centers is a 3D supramolecular assembly comprised of Mn2(tppn)(H2O)6 dinuclear subunits, lattice water molecules, and adc anions through strong hydrogen bonding interactions. On the other hand, compounds 3b and 4b are the first examples of heptacoordinated Mn(II) complexes where the two Mn(II) centers are bridged by a dicarboxylate. Compound 5 is a one-dimensional coordination polymer comprised of the Mn2(tppen)(H2O)4 dinuclear subunits and the adc group that is further connected via both hydrogen bonding and π-π interactions. This is a rare example of having adc as a linker and a counteranion in the same compound.</p>
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