

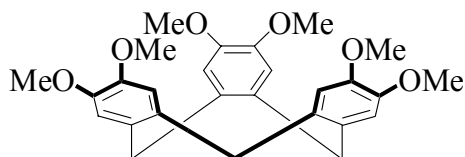
Rigid molecular hosts as building blocks for network structures

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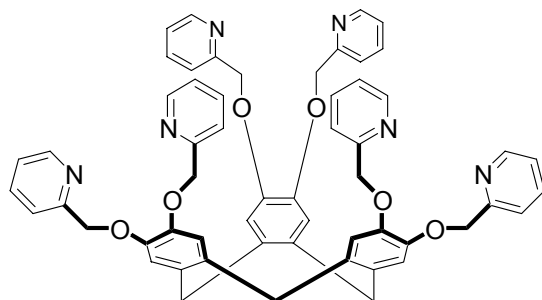
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Cyclotrimeratrylene, Hydrogen Bonding, Coordination Polymers

Cyclotrimeratrylene (CTV) is a rigid bowl-shaped molecule capable of acting as a molecular host for large guests such as fullerene and carborane.¹ Supramolecular assemblies of cyclotrimeratrylene show interactions beyond simple host-guest chemistry, with the dimethoxy moieties acting as hydrogen bond acceptors and/or chelating ligands. Complicated discrete or infinite network structures may result in the solid state. Examples include the highly complex hydrogen bonded structure of $[\text{Eu}(\text{H}_2\text{O})_9]_{1.5}(\text{CTV})_6(\text{CH}_3\text{CN})_{5.5}(\text{H}_2\text{O})_{7.5}[\text{Co}(\text{C}_2\text{B}_9\text{H}_{11})_2]_{4.5}$ ² and the series of group-1 coordination polymers formed with halogenated mono-carbaboranes where both the anion and CTV act as ligands.³ $[\text{Na}(\text{H}_2\text{O})(\text{CB}_{11}\text{H}_6\text{Br}_6)(\text{CF}_3\text{CH}_2\text{OH})]$ has a helical chain structure, while $[\text{Rb}(\text{CTV})(\text{CB}_{11}\text{H}_6\text{Br}_6)(\text{H}_2\text{O})]$ and $[\text{Cs}(\text{CTV})(\text{CB}_{11}\text{H}_6\text{Br}_6)(\text{CH}_3\text{CN})]$ shows a 2D coordination polymer of (6,3) topology. CTV is not a good ligand however, and does not allow for any degree of control over network topology. We are extending the CTV framework by adding functional groups capable of coordination to transition metals, for instance the hexa(2-methylpyridyl)CTV shown below. Hydrogen bonded network structures of CTV and coordination polymers with CTV or extended CTV will be discussed.



CTV



hexa(2-methylpyridyl)CTV

[1] M. J. Hardie, C. L. Raston, *Chem. Commun.* **1999**, 1153

[2] R. Ahmad, I. Dix, M. J. Hardie, *Inorg. Chem.* **2003**, 42, 2182

[3] R. Ahmad, A. Franken, J. D. Kennedy, M. J. Hardie, *Chem. Eur. J.* **2004**, in press.