

Functionalization of a heteroditopic cryptand: Exocyclic coordination with iron(III)

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Catecholate ligands with first-row transition metal ions as well as many heavier transition and post-transition metal ions have received enormous attention in recent years. Fe(III) forms a *tris*-catecholate complex with the highest formation constant ($\log K_f \gg 52$) of any iron chelate ever determined. A heteroditopic cryptand is derivatized with a catechol unit to have a novel receptor. The high binding ability of catechol units to Fe(III) has been utilized to bring together three such receptors. The integrity of the complex is maintained in dilute solution at room temperature. Thus, it provides a robust system for further complexation. The cavity of each cryptand unit can include a metal ion like Cu(II) to form hetero-metallic systems. This allows the study of electronic interactions between different metal ions. Besides, with exocyclic receptors appended to cryptands and preferential binding of the exoreceptors to metal ions, giant metal-driven assembly can be realized. In a cryptand based assembly, the cavities of the cryptands can be tailored to obtain systems with novel structures and bonding as well as new materials.