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Metal-Ligand Misfits: The Unusual Coordination Chemistry of Corroles

The sterically constricted N₄ core of corroles leads to unusual coordination chemistry that is distinct from that of porphyrins. For first-row transition metals, ligand noninnocence is a recurring theme, which we have investigated recently with X-ray absorption spectroscopy. Second- and third-row transition metal corroles, which we have also studied extensively in recent years, exhibit a significantly different coordination chemistry, affording some of the most dramatic examples of sterically mismatched metal-ligand assemblies, many of which are surprisingly stable. Many 5d metallocorroles also exhibit room-temperature phosphorescence, which has led us to investigate potential applications in oxygen sensing, photodynamic therapy, and dye-sensitized solar cells.