SUPRAMOLECULAR AGGREGATES OF SINGLE-MOLECULE MAGNETS FROM BIS-OXIME LIGANDS

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Single-molecule magnets (SMMs) are molecules with a large ground-state spin, *S*, and a magnetoanisotropy of the Ising-type (negative *D*). As a result, they display the classical diagnostic property of a magnet, hysteresis loops in magnetization vs applied magnetic field scans. SMMs represent a molecular approach to nanoscale magnetic materials, and also display interesting quantum properties, such as quantum tunneling of magnetization and quantum phase interference. SMMs with various structures have been prepared using a variety of ligands. Linking two or more SMMs together in order to introduce weak exchange interactions between them is important for potential applications, such as qubits in quantum computing. Recent investigations into the use of bis-oximes as potential bridging ligands have resulted in three new supramolecular Mn_{12} SMMs with interesting structures from the use of 1,2-di(pyridin-2-yl)ethane-1,2-dione dioxime (dedH_2) and 3-phenyl-1,5-di(pyridin-2-yl)pentane-1,5-dione dioxime (pdpdH_2). The syntheses, structures, magnetic characterization and supramolecular properties of these SMMs will be described.