

Structure and Properties of a Discrete Nano-Sphere

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We describe here the structural features and chemical properties of a mixed valent $\text{Cu}^{\text{I}}/\text{Cu}^{\text{II}}$ nano-sphere.

The nano-sphere is comprised of the novel scorpionate ligand $\text{Tp}^{4\text{py}}$ (tris-[3-(4'-pyridyl)-pyrazol-1-yl] hydroborate) and crystallises in the cubic space group $Fm-3c$ with cell axes of 61 Å. The packing of the nano-spheres gives rise to a very porous crystal structure.

This porosity coupled with the existence of freely accessible metal sites has led to investigations into solvent exchange and gas storage.

Preliminary results into sorption and desorption of guest molecules has shown that guest solvent molecules can be reversibly exchanged without the loss of crystallinity.