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*New Materials from the Packing and Linking of Supramolecular Nanoballs*

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We have synthesised large (2.7 nm) spherical metallosupramolecules ('nanoballs') with interesting properties [1-3]. Metal ions can be varied with retention of overall structure and crystal packing. The molecular packing creates cavities within the solid state, and the crystals readily absorb solvents such as methanol, acetonitrile or acetone (which also changes the magnetic properties), and absorb significant amounts of hydrogen and carbon dioxide (but not methane), pointing to a new class of porous materials. Other properties include switching between two magnetic spin states (spin crossover) upon change in temperature or irradiation of light, and size-selective catalysis. New packing arrangements of the nanoballs can then be achieved through variation of the counteranions or nitrile solvent, leading to new phases with different physical properties. The nanoballs can even act as octahedral building blocks for the construction of 3D coordination polymers.

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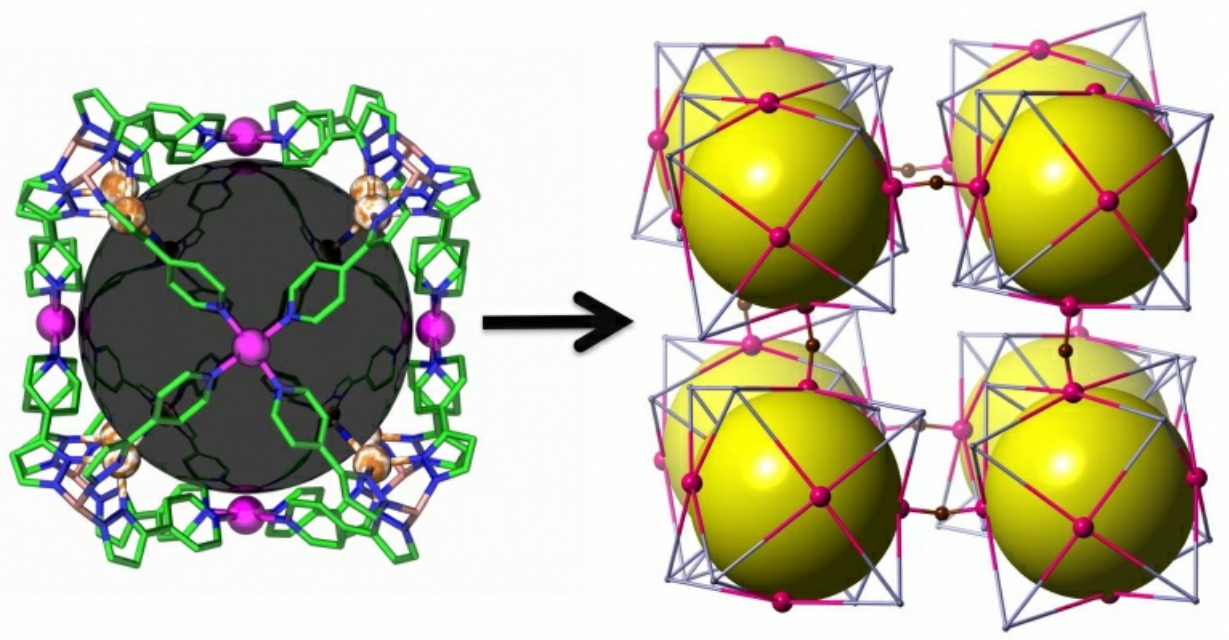

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