Finite and Infinite Supramolecular Systems

Brendan Abrahams and Richard Robson

Our research interests lie in the fields of both supramolecular chemistry and crystal engineering. In our work we bring together molecular and ionic building blocks in the hope that they will assemble into more sophisticated structures that will exhibit unusual and perhaps useful properties. We are particularly interested in the following areas:

i) Crystals that are able to sorb small molecules, particularly gases such as hydrogen, methane and carbon dioxide (an area of chemistry that is currently of immense worldwide interest).
ii) Molecular-based systems that may allow facile electron transfer throughout a crystal.

Students in our group undertake a variety of experimental activities including, organic/inorganic synthesis, spectroscopic characterization (IR, NMR, mass spec), X-ray crystallography (single crystal and powder diffraction), thermogravimetric analysis and gas sorption studies.

The following represents examples of our recent research:

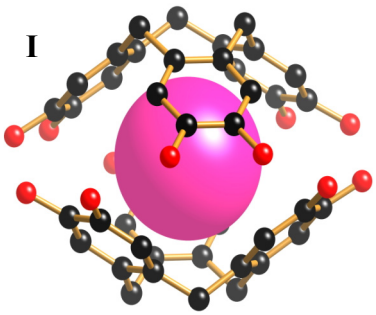
i) A supramolecular "clam" in which two anionic shell-like units, held together by hydrogen bonding, trap alkali metal cations within a hydrophobic cavity (**I**).

ii) Large supramolecular triangles (**II**), squares (**III**), hexagons, tetrahedra, cubes and trigonal prisms. Some of these structures exhibit interesting gas sorption properties.

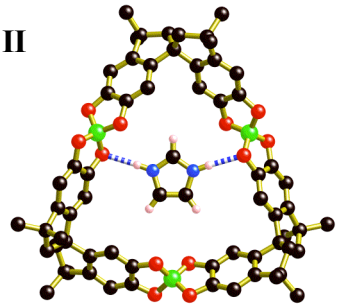
iii) An open square grid coordination polymer (**IV**) that is able to act as a host network for a variety of guest molecules such as hydrogen, nitrogen and carbon dioxide.

iv) Giant metal-ligand aggregates that contain 21 Cu(II) centres.

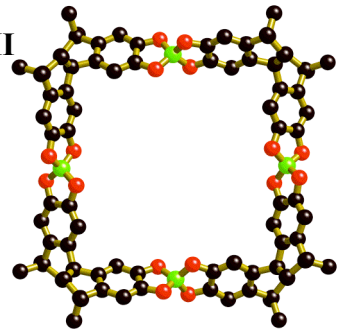
I



II



III



IV