Coordination Cages and Organic Frameworks as Selective Hosts

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An exciting research challenge in supramolecular chemistry is to design, synthesize, and characterize nano-sized architectures with applications in chemistry, materials science and biology. Predicting and designing non-covalently bound supramolecular complexes and assemblies is difficult because of the weakness of the interactions involved, thus the resulting superstructure is often a compromise between the geometrical constraints of the building blocks and the competing weak intermolecular interactions.

Our research interest has been focused on the studies of weak non-covalent intermolecular, *viz.* supramolecular interactions as the driving force in solid state self-assembly to molecular recognition and selective hosts, especially by single crystal X-ray diffraction. The lecture will highlight some of our recent studies on self-assembly and recognition properties with metal ion coordination[1] and XBOF's (halogen bonded[2] organic frameworks) in the solid state.

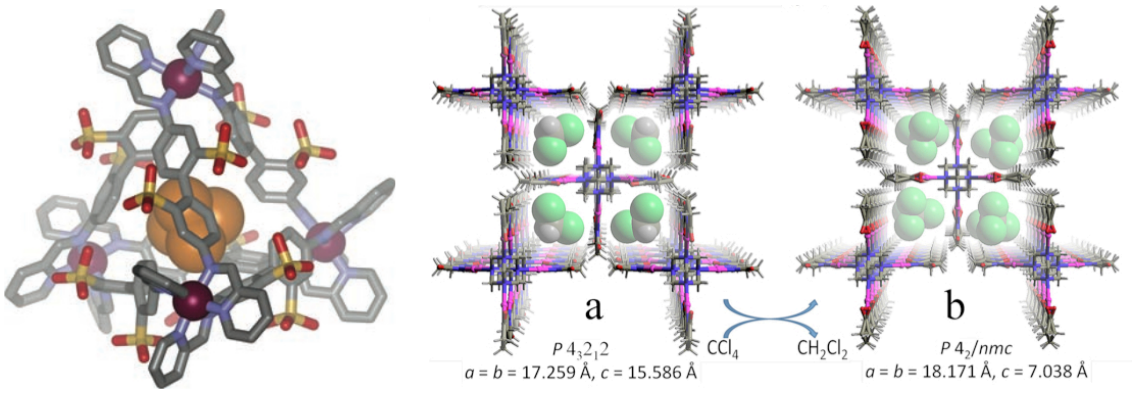

Figure 1. White phosphorus (P_4) caged inside a self-assembled water soluble tetrahedron[1b] (left) guest exchange inside a halogen bonded organic framework[2g] (right).

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2. (a) Rissanen, K., *CrystEngComm* 1107, (2008); (b) Raatikainen, K., Rissanen, K., *CrystEngComm* 750, (2009). (c) Metrangolo, P., Carcenac, Y., Lahtinen, M., Pilati, T., Rissanen, K., Vij, A., Resnati, G., *Science* **324** 1461, (2009). (d) Raatikainen, K., Huuskonen, J., Lahtinen, M., Metrangolo, P., Rissanen, K., *Chem. Comm.* 2160 (2009); e) Abate, A., Brischetto, M., Cavallo, G., Lahtinen, M., Metrangolo, P., Pilati, T., Radice, S., Resnati, G., Rissanen, K., Terraneo, G., Chem. Comm. **46**, 2724 (2010). (f) Raatikainen, K., Rissanen, K., *Cryst. Growth Des.* 3638 (2010); (g) Raatikainen, K., Rissanen, K., *CrystEngComm* (2011), in press.