MOLECULAR SWITCHES AND COORDINATION POLYMERS BASED ON THE CYCLAM FRAMEWORK

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The conception and development of molecular architectures based on inorganic and coordination complexes are of great interest due to their potential applications in catalysis, non-linear optics, molecular recognition and separations or information storage. In this context, the cyclam (1,4,8,12-tetraazacyclotetradecane) macrocycle appears to be a wonderful building block for the preparation of such molecular devices. Indeed, when cyclam derivatives coordinate to four equatorial sites of a metal cation, they can adopt five energetically distinct configurations depending on the relative orientation of the substituents on each nitrogen atom to the N4 coordination plane. Using this property, this work shows how the cyclam framework can be functionalized and assembled to generate redox-active receptors, molecular-level machines, molecular wires and coordination polymers.

References:

1. M. Ho, C. A. Mirkin, Nature **438** (2005) 651.
2. 2. C. Bucher, J.-C. Moutet, J. Pécaut, G. Royal, E. Saint-Aman, F. Thomas, Inorg. Chem., **43** (2004) 3777.
3. O. Reynes, C. Bucher, J.-C. Moutet, G. Royal, E. Saint-Aman, M. Ungureanu, J. Electroanal. Chem. **580-2** (2005) 291.
4. C. Bucher, J.-C. Moutet, J. Pécaut, G. Royal, E. Saint-Aman, F. Thomas, S. Torelli, M. Ungureanu, Inorg. Chem., **42** (2003) 2242.