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## Unusual molecular movements in the solid state

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Crystallization is a kinetic process and the experimental conditions like solvents, concentration, pH, temperature and time have greater control on the nature of products in the synthesis of coordination network structures. During crystallization, the ligands bind to the metal ions reversibly and hence, the least soluble polymer will crystallize first, independent of the metal-ligand ratio used in the crystallization. In the kinetic products, quite often the solvents are bonded to the metal ions. The removal of these coordinated solvents is likely to transform the kinetically formed coordination polymers (CPs) into thermodynamically stable products. Such structural transformations have been demonstrated in many coordination polymeric network structures, if the solid state structure of the products can be determined unequivocally. If the structural transformation to thermodynamic product is accompanied by the parallel alignment of double bonds, then the photochemical reactivity could be tested through the formation of cyclobutane rings from [2+2] cycloaddition reactions. Such techniques have been successfully used to predict the structural transformation of linear CPs to photoreactive ladder structures due to desolvation. In his laboratory the speaker has encountered a number of such molecular movements in the solid state which will be highlighted in this talk.

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