

Coordination polymers of divalent metal ions based on 1,2,4,5-benzenetetracarboxylic acid: Synthesis and structure

DIVYA KRISHNAMURTHY, M SATHIYENDIRAN and
R MURUGAVEL

Department of Chemistry, Indian Institute of Technology Bombay,
Mumbai 400 076, India

There is considerable interest in assembling extended metal–ligand polymeric networks using an organic molecule as the basic building block^{1,2}. In recent years, a number of such metal–organic frameworks have been constructed and their molecular structures established by diffraction studies. Interest in such polymeric frameworks stems from the rigidity and stability of these structures and also from their possessing pores of sizes and shapes, unobserved as yet, in zeolites and molecular sieves, which allow selective inclusion of guest molecules.

We have recently constructed several metal(II)-1,2,4,5-benzenetetracarboxylate networks starting from 1,2,4,5-benzenetetracarboxylic acid as the ligand (metal = Co, Ni, Zn and Ca). The products have been identified by elemental analyses and the usual spectroscopic methods; in addition, molecular structures of a few representative examples have been established by single crystal X-ray diffraction studies. Thermal behaviour was verified by both TGA and DTA studies. Further, we are also investigating the possibility of utilizing these compounds for modifying the 2-D and 3-D extended frameworks exhibiting unusual ion-exchange, neutral guest exchange and selective absorptive behaviour. Preliminary results of these investigations along with structural correlations are reported.

References

1. Yaghi O M, Li H and Groy T L 1996 *J. Am. Chem. Soc.* **118** 9096
2. Yaghi O M, Li G and Li H 1995 *Nature (London)* **378** 703