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Porous coordination polymers of alkyl amine ligands for carbon dioxide capture

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We have been investigating the use of alkyl amine ligands in the synthesis of porous coordination polymers. The amine groups form part of the ligand backbones, and are designed to improve the selectivity of carbon dioxide capture over other gases. More than 50 new ligands have been made, and more than a dozen porous frameworks identified and tested. The ligands investigated fall into three different categories: (i) azamacrocycles, (ii) piperazines, and (iii) linear alkyl amines. Good carbon dioxide capacities and selectivities have been observed, as well as unusual structural transformations and interesting structural features. Related work has also looked at the use of these materials for the separation of complex aromatic hydrocarbon mixtures, and the incorporation of metal carbonyl species into the ligand backbones, with a view to creating new heterogeneous catalysts.

Keywords

Coordination polymer, metal-organic framework, carbon dioxide, porosity

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