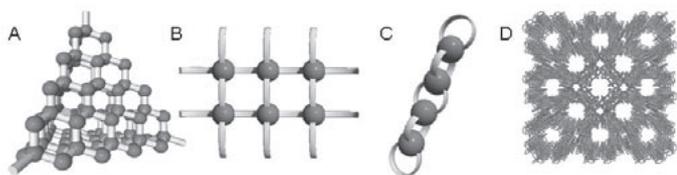


interwoven network. The disulfonic acid molecules in latter network are considerably bent by packing force. The last is a 1-dimensional supramolecular chain.



Keywords: supramolecular cluster, hydrogen-bond, higher order architecture

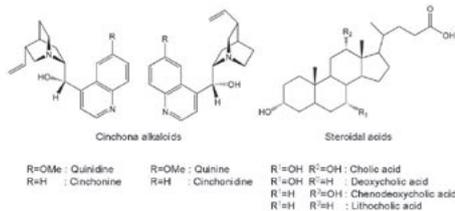
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Supramolecular structures in co-crystals composed of steroidal acids and cinchona alkaloids

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Organic crystals of steroids and alkaloids are very interesting, since these crystals involve diverse molecular assemblies with supramolecular chirality. We so far investigated inclusion crystals of steroidal acids, such as cholic acid and its derivatives, as well as brucine, one of alkaloids. Moreover, cinchona alkaloids, such as cinchonine and quinidine, are well known to form bicomponent crystals with various organic acids. To our knowledge, however, there are no systematic investigations of co-crystals composed of the steroidal acids and the alkaloids. Here we present the first study on preparation of such co-crystals as well as their supramolecular structures. The resulting co-crystals consist of hierarchical structures with hydrogen-bonded helical assemblies. The helices have right- or left-handedness on the basis of supramolecular three-axial and tilt chirality and form chiral bundles with different combinations of their directions. Moreover, we searched such supramolecular structures of the steroids and alkaloids on the basis of the Cambridge Structural Database.



Keywords: supramolecular assemblies, cocrystals, hydrogen bonds in organic crystals

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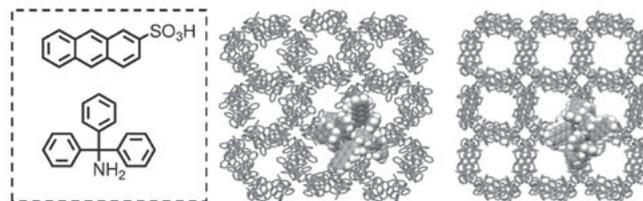
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Functional porous crystals with supramolecular clusters of triphenylmethylammonium sulfonates

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Recently, organic porous materials are studied to develop more functional porous materials. In this work, functional porous crystals were constructed by triphenylmethylammonium 2-anthracene sulfonates. Four sulfonic acids and four triphenylmethylamines were assembled by hydrogen bonding to create cubic-like hydrogen-bonding networks. As a result, they formed supramolecular clusters.

And then clusters were integrated to construct porous structures. Surprisingly, different type porous structures were built up with same clusters due to a distinction of their integration patterns. These structures were obtained by recrystallization using same solvents. Although they are composed of same host and guest molecules, they had different size inclusion spaces and different host-guest ratio. Moreover, they had guest-depending fluorescent properties. When guest molecules were desorbed by vacuum, inclusion spaces were shrunk and fluorescent colors were changed. But, porous structures were recovered by intercalation of organic solvents. At the same time, fluorescent colors were turned again. They can be said to be guest-depending functional porous structures.



Keywords: porous materials, fluorescence, organic molecular crystal structures

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Designed supramolecular assembly of novel rosette layers

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In contrast to the classical design of hydrogen-bonded supramolecular rosette motifs based on the self-assembly of two kinds of C_3 -symmetric molecular components,[1] e.g. guanidinium/organic sulfonate, trimesate/ammonium, or cyanuric acid/melamine, a novel three-component guanidinium-boric acid-carbonate rosette layer has been constructed and characterized by X-ray crystallography (Fig. 1a). In addition, deviating from the conventional topological design, the generation of new rosette motifs without the restriction of exactly matched C_3 -symmetric building blocks has been explored. Herein, the 1,2-dithiosquarate dianion and 1,1'-biphenyl-2,2',6,6'-tetracarboxylate dianion are employed in place of C_3 -symmetric anionic components to generate two-component supramolecular quasi rosette layers by varying the symmetry, shapes, and sizes of the hub moieties (Fig. 1b and 1c).

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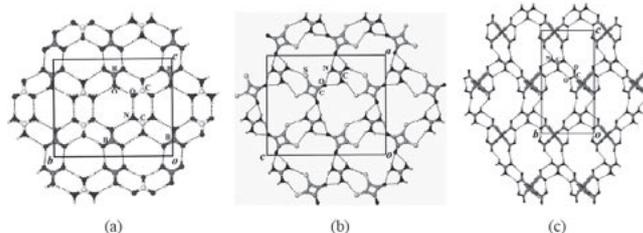


Fig. 1 Supramolecular rosette layers composed of (a) guanidinium, boric acid and carbonate; (b) guanidinium and 1,2-dithiosquarate dianion; (c) guanidinium and 2,2',6,6'-tetracarboxylate dianion.

Keywords: hydrogen bonding, rosette motif, supramolecular assemblies