修飾トリフェニルメチルアミンと四面体型スルホン酸から成る多孔質有機塩の自在な空孔設計とその物性

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Designing Void Structures and Environments of Halogen-substituted Triphenylmethylamine and Tetrahedral Tetrasulfonic Acids and Their Properties

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We have reported that organic salts, composed of aromatic sulfonic acids and bulky triphenylmethylamines (**TPMA**), are self-assembled using robust ionic hydrogen bonds to obtain a [4+4] supramolecular cluster. Self-assembly of these clusters forms diamond networks, and diamondoid porous organic salts (***d*-POSs**) are hierarchically constructed based on interpenetration among multiple diamond networks (**Figure 1a**).

In the current work, we found that the benzene rings of **TPMA** were exposed on the void surface of the porous structures, and we constructed porous structures with various void structures and environments using **TPMA** derivatives which are substituted by halogens (F, Cl, Br) at the para-positions of the benzene rings of **TPMA** and tetrahedral tetrasulfonic acids (**MTBPS**) (**Figure 1b**). We also report the correlation between their void structure and environments, and their thermal stability and gas adsorption properties. *Keywords : Ionic hydrogen bond ; Porous Organic Salt; Gas adsorption*

我々は、芳香族スルホン酸と嵩高いトリフェニルメチルアミン(**TPMA**)の有機塩が、強固なイオン性水素結合により超分子クラスターを形成し、さらに、それらの自己集合により作られるダイヤモンドネットワークが相互貫入することで、ダイヤモンド型骨格を有する堅牢な多孔質構造 (***d*-POS**) を構築することを報告してきた(**Figure 1a**)。

本研究では、**TPMA** の芳香環が ***d*-POS** の空孔表面に露出することに着目し、同芳香環のパラ位にハロゲン置換基 (F, Cl, Br) を導入した **TPMA** 誘導体と四面体型スルホン酸 (**MTBPS**)により、多様な空孔形状・環境を有する多孔質構造を構築した(**Figure 1b**)。空孔形状･環境と熱安定性･ガス吸着特性との相関についても合わせて報告する。

Figure 1. (a) Schematic image of the construction of ***d*-POS** using aromatic sulfonic acids and **TPMA**. (b) The resultant porous structures of **TPMA-X/MTBPS**.

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