デヒドロベンゾ[24]アヌレンを構成要素とする共有結合性有機構造体の構築

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Construction of covalent organic frameworks composed of dehydrobenzo[24]annulene
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Covalent organic frameworks (COFs) have been attracting much attention in the community of chemical synthesis owing to their excellent porosity and structural order that potentially lead to applications in gas sorption/storage, catalysis, or electronics. For example, COFs comprising dehydrobenzoannulene (DBA) macrocycles are expected to show unique adsorption properties due to the coexistence of micropores and mesopores, and compounds composed with C_3-symmetric [12] and [18]DBA have been already reported.[1,2] In this context, we are working on the synthesis of a COF based on a [24]DBA motif (Fig. 1).[3] Since the [24]DBA macrocycle can adopt various conformations from fully planar to highly folded, the structure of resultant COF is rather unobvious. Additionally, our past study showed that the synthesis of the [24]DBA-based COF was low in product yield and reproducibility. In the present study, we are working on improvement of the synthesis and analysis of the resultant COF, the details of which will be reported in this presentation.
Keywords : covalent organic frameworks; dehydrobenzoannulenes; porous materials

共有結合性有機構造体（COF）は，その優れた多孔質性や構造秩序からガス吸着・吸蔵，触媒，エレクトロニクスなど様々な分野での応用が期待され，活発な合成研究の対象となっている. 例えば, 環状 π 共役骨格をもつデヒドロベンゾアヌレン（DBA）を骨格要素とする COF は，マイクロ孔とメソ孔の共存による特異な吸着特性の発現などが期待され，これまでに C_3 対称型の [12] および [18]DBA からなる化合物が合成された[1,2]．これに対して我々は，より大きな環状骨格をもつ [24]DBA を骨格要素とする COF の合成に取り組んでいる（Fig. 1）[3]．[24]DBA の環状骨格は平面～非平面の配座を取り得るため，どのような立体構造の COF が得られるか自明ではない．また，過去の検討では，[24]DBA-OH をモノマーとして COF を合成した場合，収率や再現性が低いという課題がみられた．本発表では，合成条件の改良検討および得られた COF の構造解析の結果を報告する．

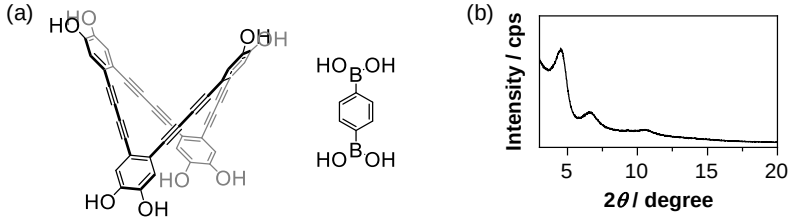

Fig. 1 (a) Structures of the COF monomers. (b) PXRD pattern of the obtained COF.[3]

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