

金属－有機構造体：MOF のガラス相の構造、特性、機能

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Glassy state of metal-organic frameworks, MOF: Structures, properties, and functions
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Metal-organic frameworks (MOFs), which are composed of metal ions and bridging ligands, have been explored for their functions based on their various crystal structures. Recently, it has been found that some of them show a transition to the glass phase. The structure of MOF glass retains the network of coordination bonds. It can be considered as an amorphous material with high compositional freedom, high structural freedom (= mobility), softness, and transparency, which are unique to glass.

In this presentation, I will introduce the design and synthesis of MOF glasses, their properties including comparison with other glasses, and their proton conductivity, porosity and optical properties.

Keywords : Metal-organic frameworks; Glass; Phase transition; Conductivity; Porosity

金属イオンと架橋性配位子から組み上がる金属－有機構造体 (MOF、あるいは配位高分子：CP) は様々な結晶構造をもとにした機能開拓がなされてきた。近年、その一部がガラス相への転移を示すことが確認され^{1,2)}、非晶質材料としても興味が持たれる。MOF ガラスの構造は配位結合によるネットワークを保持している^{3,4)}。そのため結晶相で示す多孔性や伝導性などの機能とともに、ガラス特有の「高い組成自由度」「高い内部自由度 (=運動性)」「柔らかさ」「透明性」などを備えた材料として検討できる。本発表では MOF ガラスの設計や合成法、他のガラスと比較を含めた特性、そしてプロトン伝導性や多孔性・光学特性などを紹介する。

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