Construction of Metallosupramolecular Ionic Crystals Using an Anionic Pentanuclear Complex with Penicillamine

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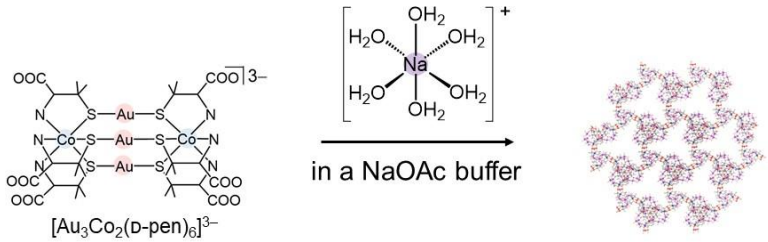
Metallosupramolecular crystals have attracted much attention due to their potential applications in molecular sorption and separation, catalysis, ion exchange, and sensor. Diverse porous metallosupramolecular crystals have been created by solvothermal reactions at high temperature or self-assembly at room temperature by using metal ions and ligands as building blocks. Among reaction conditions such as types of metal ions and organic ligands, temperature, and solvent, the combination of molecular building blocks is the most effective factor for the creation of desired metallosupramolecular crystals. Because of the variety of interactions, geometries, and directionalities, multinuclear complexes are often used as building blocks for the creation of metallosupramolecular frameworks. Recently, our group reported that the combination of anionic $Au^{I}_{3}Co^{III}_{2}$ pentanuclear complex, $[Au_3Co_2(D\text{-pen})_6]^{3-}$ (D-H_2pen = D-penicillamine), with aqua sodium cations produces a three-dimensional metallosupramolecular compound with a porosity of 78% (Figure). This compound was found to include α-CD, γ-CD, or both α-CD and γ-CD in crystal upon recrystallization.[1,2] Herein, we will report the creation of a new metallosupramolecular compound by using an analogous $Ag^{I}_{3}Co^{III}_{2}$ pentanuclear complex instead of $[Au_3Co_2(D\text{-pen})_6]^{3-}$. The inclusion behavior of guest molecules in this compound will also be reported.



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