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演　題：**Synthetic Pores for Storage, Catalysis, and Transport**

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With growing interests on the metal-organic porous materials (MOPMs), especially as materials for storage, separation and catalysis, considerable efforts have been given to get custom designed internal environments of pores or channels. We have used a simple ion exchange technique to completely exchange the framework-constituting metal ions from preassembled microporous frameworks keeping the original framework structure or topology intact. Using this method we have prepared a series of isostructural MOPMs having large channels with accessible open metal sites of different metal ions, some of them are difficult, if not impossible, to achieve from the direct assembly of their components, metal ions and ligands. In a slightly different strategy, we have synthesized catalytically active chiral MOPMs by post-synthetic modification from a preassembled achiral framework by attaching chiral catalytically active ligands to the open metal coordination sites of the host framework. The new chiral MOPMs show remarkable catalytic activities in asymmetric reactions, including much higher enantioselectivity than the corresponding chiral catalytic units as homogeneous catalysts. We also reported an extraordinary organic molecular porous material based on cucurbituril exhibiting high thermal stability, permanent porosity, and remarkable gas sorption properties. More recently, we measured the proton conductivity of the material. We also studied the ion transport phenomenon across lipid bilayer membranes utilizing nano-sized three-dimensional metal-organic cages or metal-organic polyhedra (MOP) as synthetic ion channels. Details of our recent work will be presented.

主　催：京都大学 物質ー細胞統合システム拠点（iCeMS =アイセムス）

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