

Keynote Lecture

KN11

Crystal Engineering and Applications of Functional Metal-Organic Frameworks

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As a new kind of molecular materials composed of metal ions (or clusters) and organic bridging ligands that are interconnected by coordination bonds, porous metal-organic frameworks (MOFs) have many useful characteristics, such as high crystallinity, high porosity, structural diversity, designable frameworks, framework flexibility, as well as unique and modifiable organic pore surface. Therefore, they exhibit very promising potential applications in molecular adsorption/separation, catalysis, and sensors, etc. For example, they can be used for selective adsorption and separation of different gas molecules, such as CO₂ and N₂, capture of CO₂ [2], sensing of small organic molecules and gas molecules, such as O₂ and CO₂, as well as catalysts and devices for solid-phase microextraction. In this presentation, the design and synthesis, unique pore surface, interesting functionalities will be presented by selected examples, in particular those of metal-azolate frameworks (MAFs) and a few devices useful for practical applications, from our group [1-3]. This work was supported by MoST (973 project) and NSFC.

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