Porous coordination polymers (PCPs) or metal–organic frameworks (MOFs), which are constructed from metal ions and organic ligands, have been extensively investigated to provide the nanometer-sized space that is potentially applicable in separation, heterogeneous catalysis, and gas separation/storage. Recently, we reported porous crystalline materials that can be activated by photostimulation [1] and demonstrated that photochemical modification is a powerful method for the control of physical properties of PCPs or MOFs.

In this report, synthesis and properties of new PCPs containing trans-1,2-bis(4-pyridyl)ethene (bpe) as a photoactive module will be presented. The photoactive PCPs adsorb gaseous molecules such as carbon dioxide. The bpe molecules quantitatively take place topochemical [2+2] cycladdition reactions and the PCPs show single-crystal to single-crystal (SCSC) transformations upon UV irradiation (> 300 nm). We will discuss not only the SCSC transformations but also the impact on the photochemical transformations on the sorption properties.


Keywords: microporous, photoreaction, adsorption

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Photo-responsive Pores of Porous Coordination Polymers

Hiroshi Sato, a,b Ryotaro Matsuda, a,b Susumu Kitagawa, a,b,c *Exploratory Research for Advanced Technology (ERATO), (Japan) Science and Technology Agency (JST), Kyoto, (Japan). *Institute for Integrated Cell-Material Sciences, Kyoto University, Kyoto, (Japan). cDepartment of Synthetic Chemistry and Biological Chemistry, Graduate School of Engineering, Kyoto University, Kyoto, (Japan). E-mail: hiroshi.sato@kip.jst.go.jp

The crystal structure of Ziegler-Natta catalyst supports

Giuseppe Cruciani, a Federica Malizia, a Anna Fait, a *Department of Earth Sciences, University of Ferrara, Ferrara (Italy). *Basell