Structural Design and Application of Mutifunctional Properties Induced by Heterogeneous Guests in Metal-Organic Frameworks

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Organic molecules have excellent reactivity and selectivity and are used in various fields such as catalyst, sensors, dye, and etc. However, due to the organic molecular structure, there is a limitation of instability such as dimerization and self-quenching in solution. In this studyc, it is provided a tailored platform suitable for each application while maintaining the unique properties of the widely used photoactive molecules. Therefore, the spatial design based on the porous metal-organic frameworks(MOFs) was studied to improve platform-based characteristics and impart functions, not the structural modification of the molecule itself. The MOF has a porous crystalline structure in which pores are regularly arranged. By utilizing these advantages of MOF, which enables structural design and has excellent space utilization, it accesses three spaces, the inner pores, the structural skeleton, and the outer surface, to improve the stability of organic molecules and optimize performance. Herein, this study deals with research applied to rhenium photocatalyst and fluorescent bio-imaging agent by custom designing ligands constituting the skeleton and pores constituting the interior.