

Preparation of hydrogel-based multifunctional heterogeneous catalysts with easy control of catalyst activities

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Porous hydrogel-based multifunctional (multicompartmental) catalysts, which have both acid (copolymerized carboxyl acid moiety) and hydrogenation catalyst (Pd nanoparticle) compartments, was prepared using the micromolding method, and the size and the number of compartments can be freely controlled in the one particle. The prepared bifunctional catalysts have activities for the deacetylation and the hydrogenation, and also shows excellent activity in the cascade reaction in which these two reactions are sequentially connected. Further, it is also found that the catalyst compartments have homogeneous active sites and low diffusion resistance. Most of all, it is expected to provide the possibility of the optimizing the cascade reaction which can be achieved by the preparation of size-controllable anisotropic compartment catalysts.