Environmentally friendly and recyclable catalyst systems

Ming XIa, 박범준†
경희대학교
(bjpark@khu.ac.kr†)

We fabricated recyclable and environmentally friendly hydrogels based catalyst for the 4-nitrophenol reduction using the dripping method. The alginate aqueous solution containing palladium (Pd) nanoparticles and magnetite nanoparticles was dropped through a tapered glass capillary to the surface of the water with divalent cations. The alginate hydrogels formed immediately upon contact with the aqueous solution. The shape of the hydrogels could be controlled by varying the distance between the capillary orifice and the water surface. The prepared Pd-embedded non-spherical alginate hydrogels were used as catalysts and catalyst supports for the 4-nitrophenol reduction. We investigated the catalytic efficiency depending on the magnetic stirring, Pd-coating method, and dryness of the alginate particles. Furthermore, we analyzed the recyclability of the alginate hydrogels by varying the alginate concentration and the species of divalent cations.