

Organophosphorus Hydrolase Immobilized in γ -Alumina Nanocatalyst for Enzymatic Reaction

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Herein, we report on the synthesis of nanocatalyst including γ -alumina nanoparticles with good textural properties as a host matrix and organophosphorus hydrolase (OPH) as a guest material for the enzymatic reaction. After the immobilization of OPH on γ -aluminas, the structures of γ -alumina nanoparticles were conserved, as elucidated by TEM and XRD analysis. The physical properties of OPH-immobilized γ -alumina nanoparticles were characterized by TGA and gas sorption/desorption analysis. The as-obtained nanocatalyst exhibited higher catalytic performance compared to those of OPH-immobilized commercial aluminas, due to not good textural properties of γ -aluminas but also favorable interactions between the host and guest materials. Therefore, the OPH-immobilized γ -alumina nanoparticles serve as an advanced biocatalyst based on a host-guest system for the application in enzymatic reaction [This work was supported in part by MIC & IITA through IT Leading R&D Support Project.].