

Polystyrene modification using nonporous silica based heterogeneous catalyst

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Chemical modification of polymers after polymerization can be solved the limitation of monomer functional groups for produce well-defined block co-polymer designs. Even though, those are used for various catalytic process of small molecules, traditional heterogeneous catalysts supported on high surface area supports were tricky accessibility issues when it used for macromolecule. We developed non-porous silica nanoparticle based catalysts. After functionalize the non-porous silica for control the surface characteristics, we loaded palladium nanoparticles. Polystyrene hydrogenation reaction using these non-porous silica based catalysts shown impressive activities compared with conventional high surface area silica based catalysts. Furthermore, it is shown the possibility of selectivity control of block co-polymer by modification of surface characteristics.