IX-K Aquacatalysis

Catalytic organic transformations under mild, safe, and green conditions are important goals in synthetic organic chemistry. We recently reported that several palladium-catalyzed reactions, including π-allylic substitution, carbonylation, the Heck reaction, and Suzuki-Miyaura cross-coupling, took place in water by use of palladium-phosphine complexes bound to an amphiphilic polystyrene-poly(ethylene glycol) graft copolymer (PS-PEG) resin. Rhodium-catalyzed hydroformylation, cyclotrimerization of alkynes, and Michael-type addition of arylboronic acids were also found to proceed smoothly in water. Here we wish to report recent progress in this subject.

IX-K-1 Catalytic Oxidation of Alcohols in Water under Atmospheric Oxygen by Use of an Amphiphilic Resin-Dispersion of Nano-Palladium Catalyst

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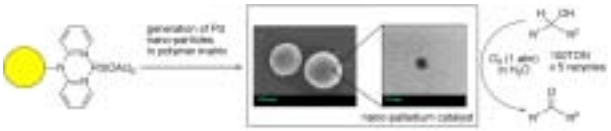
[*Angew. Chem., Int. Ed.* **42**, 194–197 (2003); *Angew. Chem.* **115**, 204–207 (2003)]

An amphiphilic polystyrene-poly(ethylene glycol) resin-dispersion of palladium nanoparticles was designed and prepared with a view toward use for catalysis in water. The catalytic aerobic oxidation of various alcohols forming aldehydes, ketones, and carboxylic acids was achieved in water under atmospheric pressure conditions by use of the PS-PEG supported nano-palladium catalyst.



IX-K-2 PS-PEG Resin-Supported Palladium-MOP Complexes. Application in Asymmetric π-Allylic Reduction

UOZUMI, Yasuhiro; HOCKE, Heiko

Homochiral palladium complexes of polymeric 2'-, 6-, and 6'-anchored 2-diphenylphosphino-1,1'-binaphthyl (MOP) ligands were prepared on polystyrene-poly(ethylene glycol) (PS-PEG) resin. The PS-PEG resin-supported palladium-MOP complexes exhibited high catalytic activity, stereoselectivity (up to 80% ee), and recyclability (6 times) in the asymmetric allylic reduction of 1-vinyl-1,2,3,4-tetrahydronaphth-1-yl benzoate to give 1-vinyl-1,2,3,4-tetrahydronaphthalene.