PdCl₂ Immobilized on Poly(styrene-co-maleimide) as an Effective Heterogeneous Catalyst for Suzuki Cross-Coupling Reaction

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Abstract

Poly(styrene-co-maleic anhydride) (SMA) was reacted with 4-amino-6-methyl-3-thioxo-1,2,4-triazine-5-one to obtain the corresponding imide [SMI] which was used as a substrate for immobilization of PdCl₂ and preparation of palladium nanoparticles (PdNPs). The supported PdNPs were fully characterized using scanning electron microscopy (SEM), energy dispersive X-ray (EDAX) and FTIR spectroscopy, and inductively coupled plasma spectrometry (ICP). The catalytic efficiency of the PdNPs was evaluated examined successfully in one the established and useful reaction so-called the Suzuki cross-coupling reaction involving the reaction of various aryl halides with phenylboronic acid in water. The advantages of this procedure include easy recovery and efficient reusability of the expensive PdNPs, high yields of the cross coupled products, short reaction times, and use of water as a green solvent for a wide range of substrates.

Keywords: boronic acid, PdCl₂, poly(styrene-co-maleic anhydride), polymer support, SMI–PdCl₂, Suzuki cross-coupling reaction