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Pyrene-Tagged Dendritic Catalysts Noncovalently Grafted onto Magnetic Co/C Nanoparticles: An Efficient and Recyclable System for Drug Synthesis

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Suzuki Coupling Using Co/C MNPs-Immobilized Dendritic Phosphine–Pd

Category

Polymer-Supported Synthesis

Key words

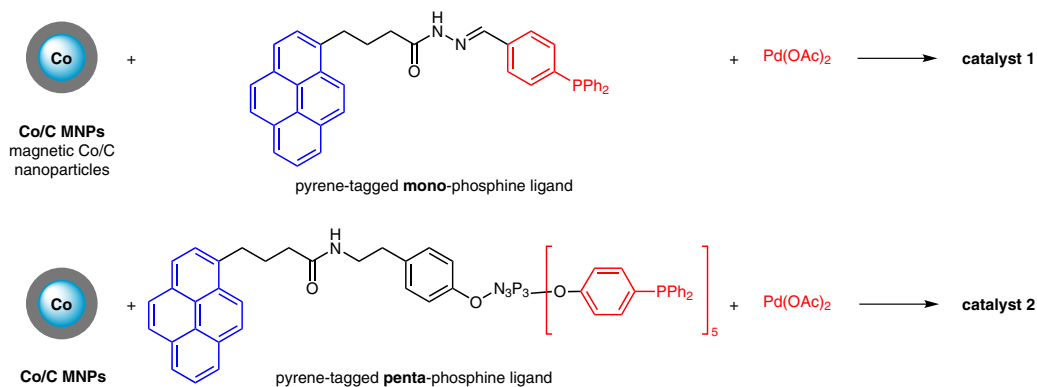
magnetic Co/C nanoparticles

palladium

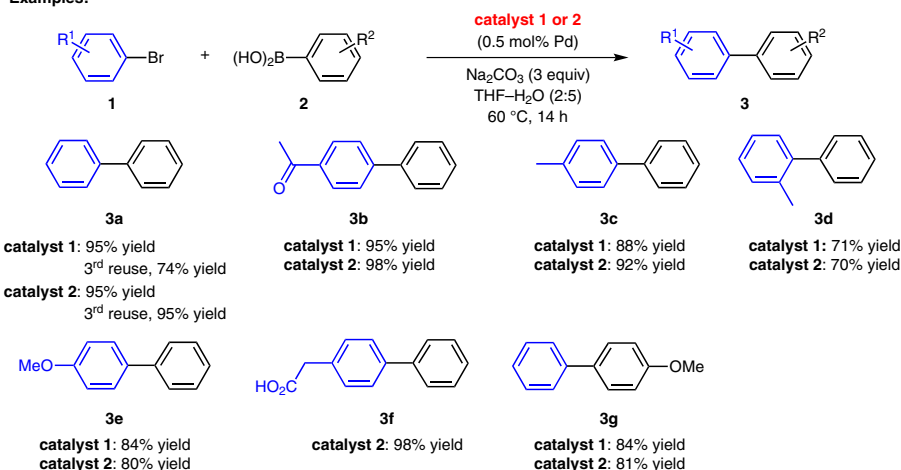
pyrene-tagged phosphine

Suzuki coupling

SYNFACT
of the month



Examples:



Significance: Pyrene-tagged mono- and penta-phosphine–palladium complexes were immobilized on graphene layers of magnetic Co/C nanoparticles through π – π interactions. The resulting catalysts **1** and **2** were applied to the Suzuki–Miyaura coupling of aryl bromides **1** and boronic acids **2** to afford the corresponding biaryls **3** in 70–98% yield (seven examples). These catalysts were separated from the reaction mixture by magnetic decantation.

Comment: Catalyst **2** was reused ten times without significant loss of catalytic activity (felbinac **3f**, 1st use: 100% GC yield; 11th use: 100% GC yield). ICP-MS analysis for the first cycle showed that about 6% of the introduced palladium leached out into the crude mixture (111 ppm palladium). After the extraction with CH₂Cl₂, the contamination of palladium became less than 5 ppm, and no traces of cobalt were detected.

SYNFACTS Contributors: Yasuhiro Uozumi, Yoichi M. A. Yamada, Aya Ohno

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