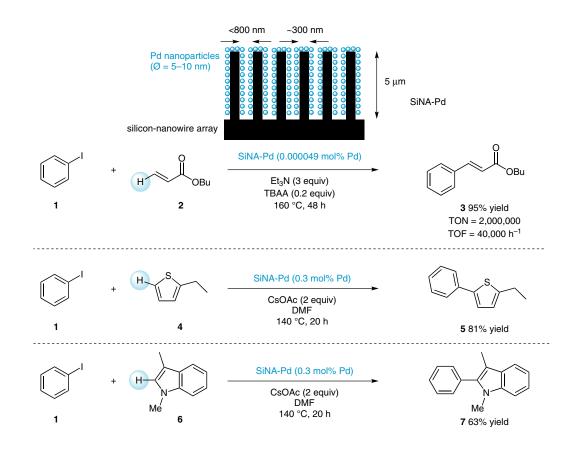
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A Silicon Nanowire Array Stabilized Palladium-Nanoparticle Catalyst



Significance: A silicon nanowire array stabilized palladium-nanoparticle catalyst (SiNA-Pd) for C–H functionalization was developed. Thus, the Mizoroki–Heck reaction of iodobenzene (1, 50 mmol, 10.2 g) and butyl acrylate (2, 2 equiv) proceeded in the presence of SiNA-Pd, Et₃N, and tetrabutylammonium acetate (TBAA) to give butyl cinnamate (3) in 95% yield (9.7 g). SiNA-Pd was applied to the C–H functionalization reactions of thiophene 4 and indole 6, the hydrogenation of an alkene, and the hydrosilylation of an enone.

Comment: The turnover number (TON) of SiNA-Pd was 2×10^6 for the reaction of **1** and **2**, which is the highest TON for any Mizoroki–Heck reaction with a heterogeneous catalyst. A thromboxane A2 synthesis inhibitor, (2*E*)-3-[4-(1*H*-imidazol-1-yl-methyl)phenyl]acrylic acid (ozagrel), was prepared via the SiNA-Pd-mediated Mizoroki–Heck reaction.

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Category

Polymer-Supported Synthesis

Key words

silicon-nanowire array

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Mizoroki-Heck reaction

C-H functionalization

