

# A Silicon Nanowire Array Stabilized Palladium-Nanoparticle Catalyst

Category

Polymer-Supported Synthesis

Key words

silicon-nanowire array

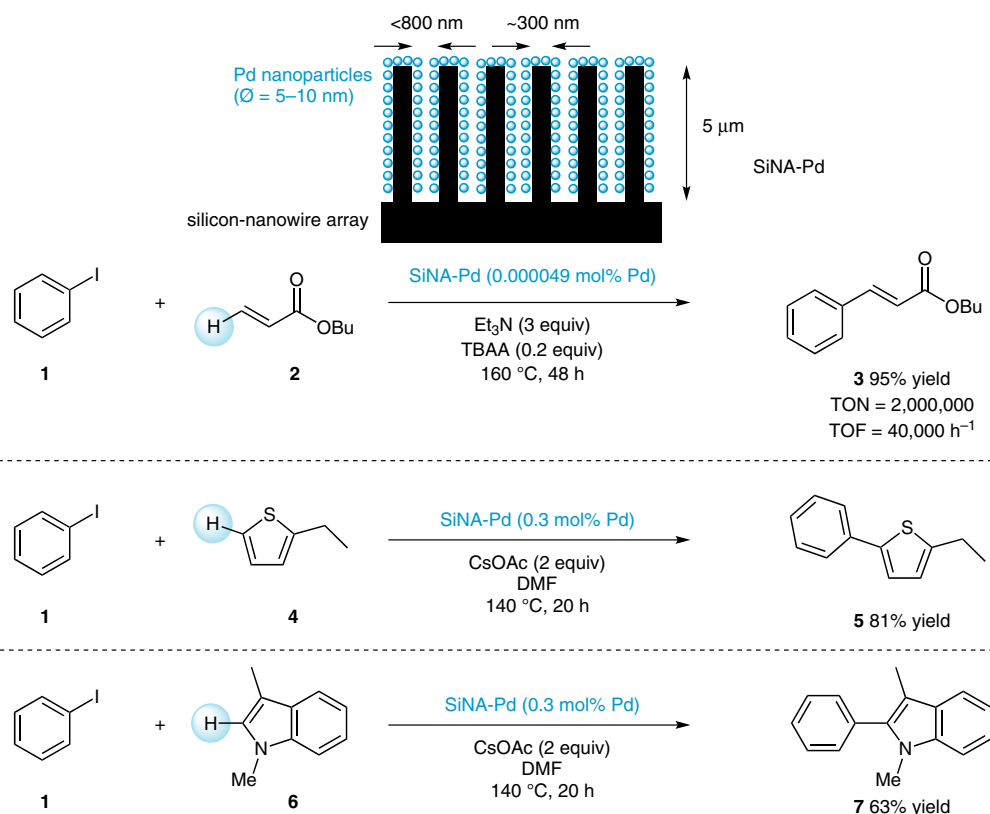
palladium nanoparticles

Mizoroki–Heck reaction

C–H functionalization

**SYNFACT**  
*of the month*

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**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, Et<sub>3</sub>N, 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  $2 \times 10^6$  for the reaction of **1** and **2**, which is the highest TON for any Mizoroki–Heck reaction with a heterogeneous catalyst. A thromboxane A<sub>2</sub> 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.