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Efficient Click-Polymer-Stabilized Palladium Nanoparticle Catalysts for Suzuki–Miyaura Reactions of Bromoarenes and Reduction of 4-Nitrophenol in Aqueous Solvents
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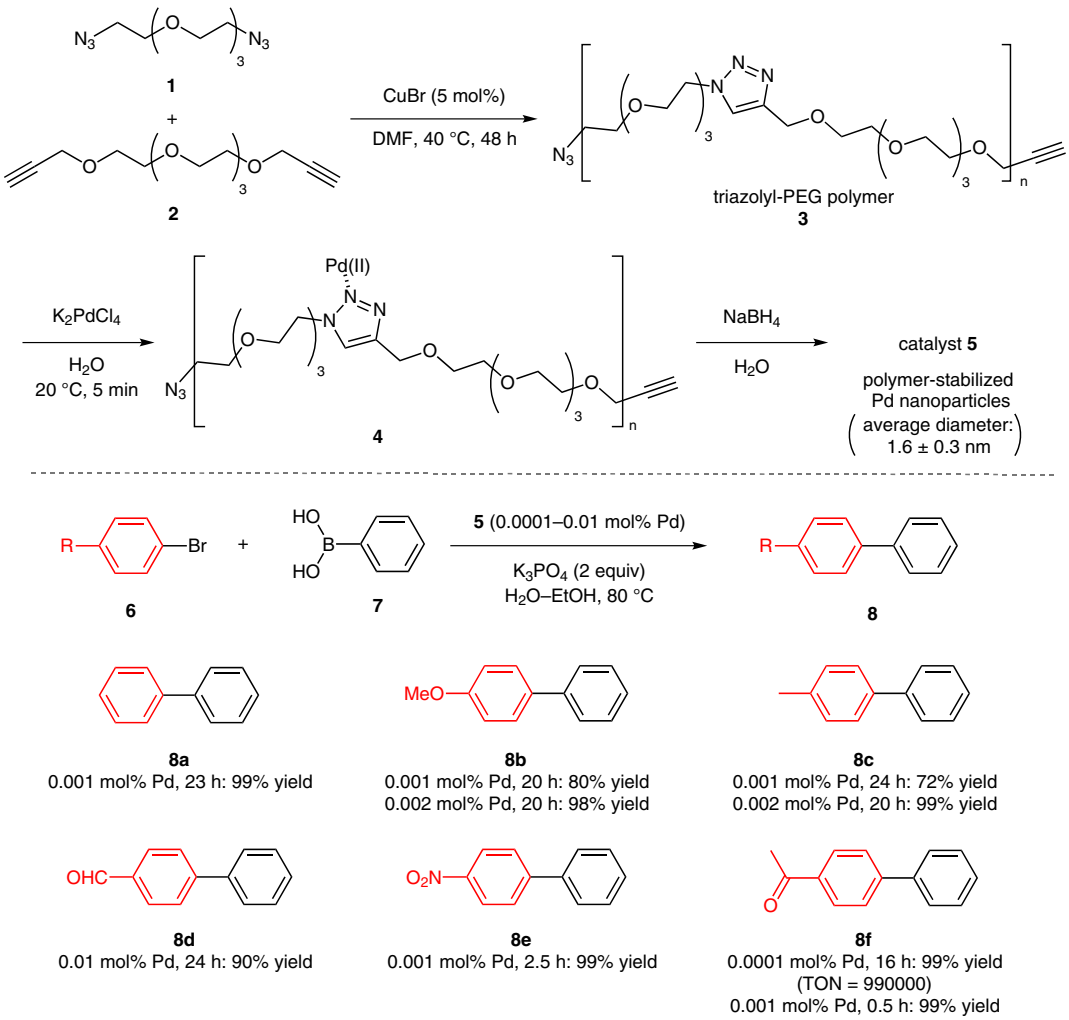
Suzuki–Miyaura Coupling Using Polymer-Stabilized Pd Nanoparticles



Significance: Triazolyl-PEG polymer-stabilized palladium nanoparticles (PdNPs) **5** were prepared and applied to the Suzuki–Miyaura coupling. The reaction of aryl bromides **6** and phenylboronic acid (**7**) took place with 0.0001–0.01 mol% Pd of catalyst **5** to give the corresponding products **8** in 90–99% yield. The turnover number (TON) reached up to 990000.

Comment: The Pd(II) catalyst **4** showed lower catalytic activity than the reduced catalyst **5** for the formation of **8f** with 0.001 mol% Pd. For a quantitative reaction of 4-bromoacetophenone and phenylboronic acid, 22 hours were needed with catalyst **4** instead of two hours with PdNP catalyst **5**. The average diameter of the Pd nanoparticles of **5** is 1.6 ± 0.3 nm.

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Category
Polymer-Supported Synthesis

Key words
Suzuki–Miyaura coupling
palladium nanoparticles
aryl bromides
triazolyl-PEG polymers