Category

Polymer-Supported Synthesis

Key words

bifunctional catalysis

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A Heterogeneous Layered Bifunctional Catalyst for the Integration of Aerobic Oxidation and Asymmetric C–C Bond Formation

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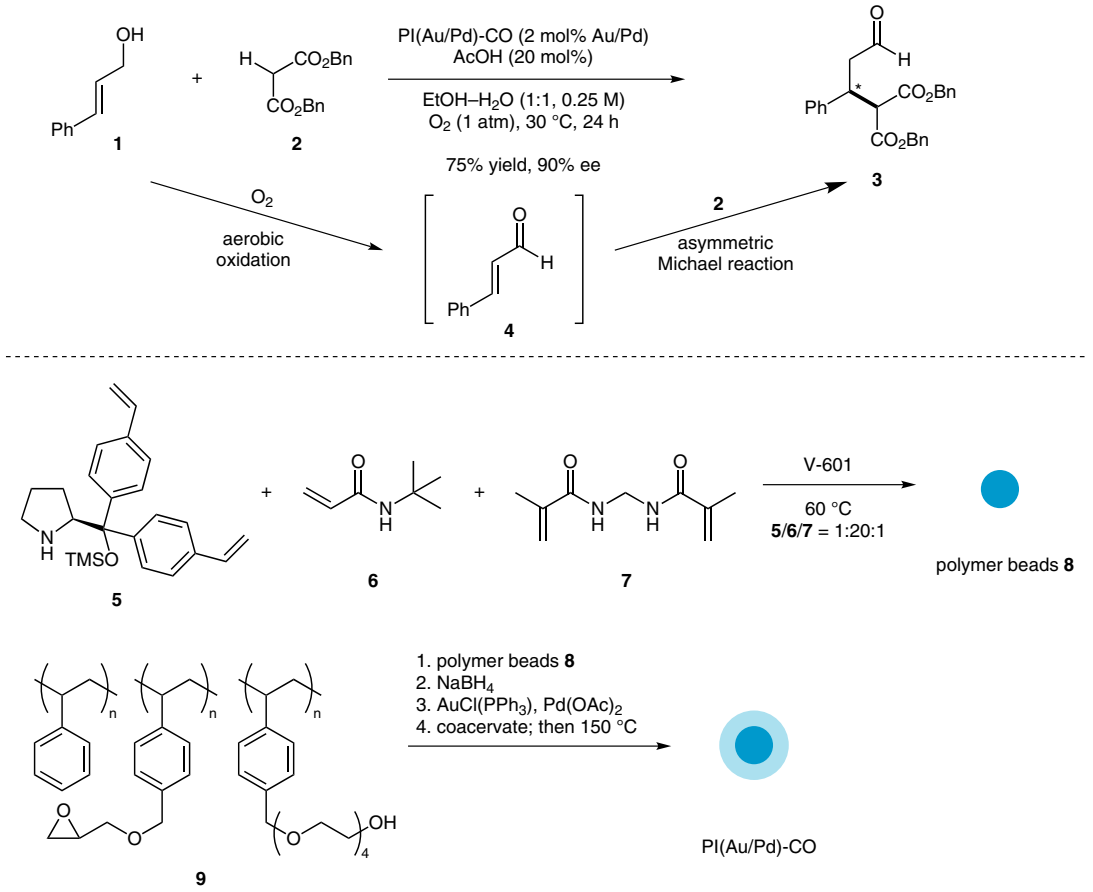
A Heterogeneous Bifunctional Au/Pd Nanoparticle Organocatalyst



Significance: The preparation of a polymer-incarcerated Au/Pd-coated organocatalyst [PI(Au/Pd)-CO] for the sequential aerobic oxidation–Michael reaction between γ-substituted allylic alcohols and dibenzylmalonate was described. The reaction of 3-phenyl-2-propen-1-ol (**1**) and dibenzylmalonate (**2**) proceeded in the presence of PI(Au/Pd)-CO to give dibenzyl 2-(3-oxo-1-phenylpropyl)propanedioate (**3**) in 75% yield with 90% ee (other 9 examples: 34–83% yield, 74–91% ee).

Comment: The Au/Pd organocatalyst was prepared by the copolymerization of monomers **5**, **6** and **7** in the presence of V-601 [dimethyl 2,2′-azobis(2-methylpropionate)] as a radical initiator followed by the formation of the cross-linked shell layer of a polymer **9** in which bimetallic Au/Pd nanoparticles were incorporated. Thus, PI(Au/Pd)-CO was composed of an organocatalytic resin core and a polymeric Au/Pd nanoparticle shell.

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