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A One-Pot Synthesis of (*E*)-Disubstituted Alkenes by a Bimetallic [Rh-Pd]-Catalyzed Hydrosilylation/Hiyama Cross-Coupling Sequence

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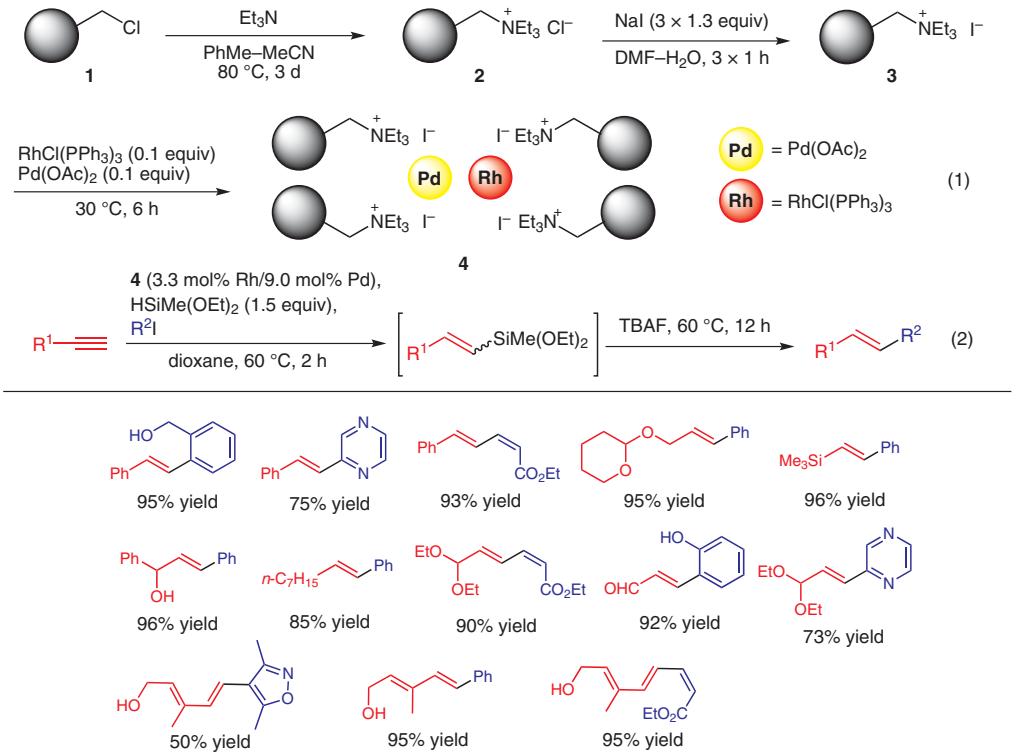
[Rh-Pd] Ionic Gel-Soaked Bimetallic Catalyst



Significance: The [Rh-Pd] ionic gel-soaked bimetallic catalyst for the one-pot hydrosilylation/Hiyama cross-coupling reactions was described. Thus, the reaction of Merrifield resin **1** with Et_3N, followed by the anion exchange of **2** with NaI afforded the polyionic iodide gel **3**. The polyionic iodide gel **3** was treated with $RhCl(PPh_3)_3$ and $Pd(OAc)_2$ to provide the [Rh-Pd] bimetallic catalyst **4**. The one-pot synthesis of *E*-disubstituted alkene via hydrosilylation/Hiyama cross-coupling reaction was carried out in dioxane in the presence of **4** and subsequent addition of TBAF to give the corresponding *E*-alkenes in 50–95% yield.

Comment: It is noteworthy that the Sonogashira coupling side products were not obtained, even without sequential addition of coupling partners in the present procedure. The high chemoselectivity is attributed to a slower Sonogashira coupling in polyionic gel in the absence of copper co-catalysts. For the reaction of phenyl acetylene with phenyl iodide, the catalyst can be recycled three times without loss of the catalytic activity and stereoselectivity (>99% yield and *E*/*Z* > 99:1 for 1st-3rd cycles); however, the product yield decreased in the 4th cycle (78% yield and *E*/*Z* > 99:1).

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