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Supported Ruthenium–Carbene Catalyst on Ionic Magnetic Nanoparticles for Olefin Metathesis
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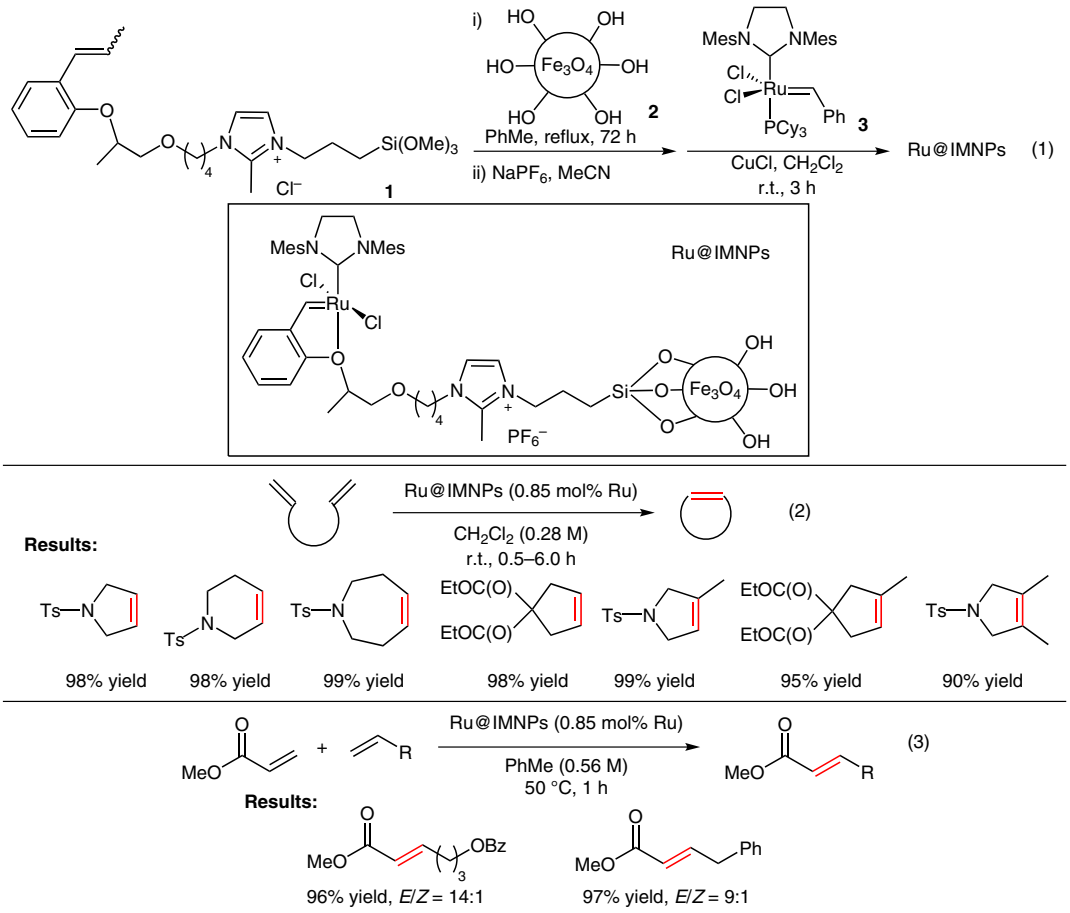
Olefin Metathesis with Ruthenium–Carbene Supported on Iron Oxide



Significance: The Grubbs–Hoveyda ruthenium–carbene complex supported on ionic magnetic nanoparticles (Ru@IMNPs) was prepared by immobilization of imidazolium chloride **1** onto Fe_3O_4 **2**, anion exchange with $NaPF_6$, and metathesis with ruthenium complex **3** (eq. 1). Ru@IMNPs catalyzed the ring-closing metathesis of dienes to give the corresponding cyclic olefins in 90–99% yield (eq. 2). The cross-metathesis of methyl acrylate with olefins using Ru@IMNPs also proceeded with high *E*-selectivity (eq. 3).

Comment: In the ring-closing metathesis of *N*,*N*-diallyl tosylamide, the catalyst was recovered magnetically and reused five times without significant loss of catalytic activity (6th run: 96% conversion), although ICP-MS analysis showed significant leaching of the ruthenium species into the product (a loss of 54% of the ruthenium content of the fresh catalyst) during the initial three runs of the recycling experiment.

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Polymer-Supported Synthesis

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iron oxide
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