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Oxidation of Secondary Amines to Nitrones Using Magnetically Separable Tungstophosphoric Acid Supported on Silica-Encapsulated γ-Fe_2O_3 Nanoparticles
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Category

Polymer-Supported Synthesis

Key words

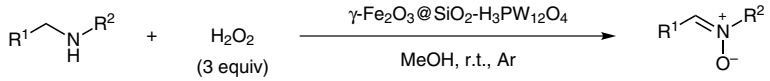
nitrones

secondary amines

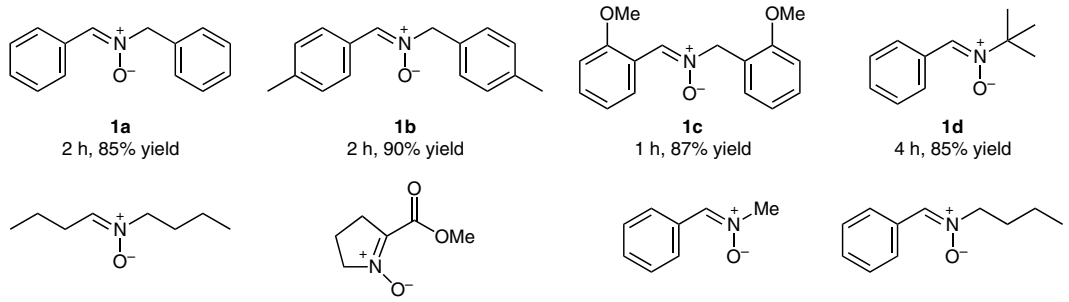
oxidation

heterogeneous catalysis

Preparation of Nitrones Using γ-Fe_2O_3@SiO_2-$H_3PW_{12}O_{40}$



Results:



1a 2 h, 85% yield

1b 2 h, 90% yield

1c 1 h, 87% yield

1d 4 h, 85% yield

1e 12 h, 70% yield

1f 12 h, 65% yield

1g 3 h, 53% yield

1h 3.5 h, 55% yield

Significance: The oxidation of secondary amines by superparamagnetic tungstophosphoric acid supported on silica-encapsulated γ-Fe_2O_3 (γ-Fe_2O_3@SiO_2-$H_3PW_{12}O_{40}$) was carried out with an aqueous hydrogen peroxide as oxidant to give the corresponding nitrones **1a**–**h** in up to 90% yield.

Comment: The γ-Fe_2O_3@SiO_2-$H_3PW_{12}O_{40}$ nanoparticles were readily recovered by an external magnet and reused three times without significant loss of catalytic activity (1st reuse: **1a** 85% yield, 3rd reuse: **1a** 80% yield). The authors previously reported the preparation of γ-Fe_2O_3@SiO_2-$H_3PW_{12}O_{40}$ and its application to the synthesis of formamidines (*J. Mol. Struct.* **2012**, *1027*, 156).

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