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Oxidation of Secondary Amines to Nitrones Using Magnetically Separable Tungstophosphoric Acid Supported on Silica-Encapsulated γ-Fe₂O₃ Nanoparticles

Preparation of Nitrones Using γ-Fe₂O₃@SiO₂-H₃PW₁₂O₴₀

**Results:**

- \( R^1\text{N}^+\text{N}^+R^2 \) (R₁: aromatic, R₂: aliphatic, MeOH, r.t., Ar)
- \( \gamma\text{-Fe₂O₃@SiO₂-H₃PW₁₂O₴₀} \) (3 equiv)
- \( \text{H₂O₂} \)

**Significance:** The oxidation of secondary amines by superparamagnetic tungstophosphoric acid supported on silica-encapsulated γ-Fe₂O₃ 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-Fe₂O₃@SiO₂-H₃PW₁₂O₴₀ 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-Fe₂O₃@SiO₂-H₃PW₁₂O₴₀ and its application to the synthesis of formamidines (J. Mol. Struct. 2012, 1027, 156).