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Cu₂O Mesoporous Spheres with a High Internal Diffusion Capacity and Improved Catalytic Ability for the aza-Henry Reaction Driven by Visible Light

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Visible-Light-Promoted aza-Henry Reaction Using Mesoporous Cu₂O

Significance: Mesoporous copper(I) oxide spheres with different pore sizes (5 nm for SP-Cu₂O and 15 nm for LP-Cu₂O) were prepared and applied to the visible-light-promoted aza-Henry reaction. The reaction of *N*-aryl tetrahydroisoquinolines **1** with nitroalkanes **2** was carried out in the presence of LP-Cu₂O and molecular oxygen under the irradiation of blue LEDs to afford the corresponding coupling products **3** in 83–90% yield. The reaction without catalyst gave **3a** in only 5% yield under otherwise similar conditions.

Comment: The catalysts were characterized by SEM, TEM, XRD, and N₂ adsorption–desorption analyses. For the formation of **3a**, LP-Cu₂O was recovered by centrifugation and reused four times without significant loss of catalytic activity. SEM observation of LP-Cu₂O after the fifth run showed no change of its morphology. The preparation of mesoporous Cu₂O spheres with small pore size was previously reported by Shang, Zhang and Guo (*J. Mater. Chem.* **2012**, 22, 856).

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