Photocatalytic Sonogashira Coupling on Polymeric Pyrazine–CuO Nanoparticles

Significance: CuO nanoparticles stabilized on a polymeric amine (poly\textsuperscript{1}–CuO NPs) were prepared by treatment of CuCl\textsubscript{2} with the benzopyrazine-derived amine \textsuperscript{1} in water under air. Poly\textsuperscript{1}–CuO NPs promoted the photocatalytic Sonogashira coupling of aryldiacides \textsuperscript{2} with ethynylbenzene \textsuperscript{3} under visible-light irradiation to give the corresponding products \textsuperscript{4} in ≤89% yield.

Comment: Poly\textsuperscript{1}–CuO NPs were characterized by means of FT-IR and UV-vis, and fluorescence spectroscopy and XRD, SEM, and TEM analyses. The reaction of iodobenzene with \textsuperscript{3} in darkness gave \textsuperscript{4a} in 30% yield. In the absence of poly\textsuperscript{1}, CuO nanoparticles catalyzed the reaction to give \textsuperscript{4a} in 48% yield in 12 hours. Poly\textsuperscript{1}–CuO NPs were reused five times without significant loss of their catalytic activity.