Photocatalytic Sonogashira Coupling on Polymeric Pyrazine–CuO Nanoparticles

Significance: CuO nanoparticles stabilized on a polymeric amine (poly1–CuO NPs) were prepared by treatment of CuCl2 with the benzopyrazine-derived amine 1 in water under air. Poly1–CuO NPs promoted the photocatalytic Sonogashira coupling of aryl halides 2 with ethynylbenzene 3 under visible-light irradiation to give the corresponding products 4 in ≤89% yield.

Comment: Poly1–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 3 in darkness gave 4a in 30% yield. In the absence of poly1, CuO nanoparticles catalyzed the reaction to give 4a in 48% yield in 12 hours. Poly1–CuO NPs were reused five times without significant loss of their catalytic activity.