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.

Selected results:
- 4a: X = Cl, 4 h, 60% yield
- 4b: X = I, 12 h, 45% yield
- 4c: X = I, 5 h, 78% yield
- 4d: X = Br, 6 h, 79% yield
- 4e: X = Br, 7 h, 78% yield
- 4f: X = Br, 5 h, 75% yield
- 4g: X = Br, 5 h, 72% yield
- 4h: X = Br, 10 h, 58% yield