Hydrogenolysis of Diaryl Ether C–O Bonds Using a Nickel/Carbon Catalyst

**Results:**

- 2a: 85% yield, A/B = 4:1
- 2b: 78% yield, A/B = 5:1
- 2c: 83% yield, A/B = 5:1
- 2d: 71% yield, A/B = 5:1
- 2e: 41% yield, A/B = 7:1

**Significance:** The hydrogenolysis of compounds that mimic the diaryl ether moieties in lignin was catalyzed by nickel nanoparticles on carbon (Ni/C) in the presence of sodium tert-butoxide or potassium hexamethyldisilazide under hydrogen to give the corresponding arenes in >98% yield and high selectivity. The hydrogenolysis of ether 1 with Ni/C took place without significant aggregation of nickel particles [2–5 nm (1 h); 5–7 nm (24 h)].

**Comment:** \([\text{Ni(cod)}]_2\) (10 mol%) catalyzed the hydrogenolysis of ether 1 at 180 °C for 24 hours with 20% conversion; during this period, the nickel particles aggregated from a size of 4–13 nm (1 h) to 17–23 nm (24 h), as observed by TEM. The authors previously reported that hydrogenolysis of 1 occurred in 45% conversion yield with a ligand-free nickel catalyst at 120 °C for 48 h (Science 2011, 332, 439).