Title:	Homogeneous Nickel-Catalyzed Sustainable Synthesis of Quinoline and Quinoxaline under Aerobic Conditions
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Abstract:	Dehydrogenative coupling-based reactions have emerged as an efficient route toward the synthesis of a plethora of heterocyclic rings. Herein, we report an efficacious, nickel-catalyzed synthesis of two important heterocycles such as quinoline and quinoxaline. The catalyst is molecularly defined, is phosphine-free, and can operate at a mild reaction temperature of 80 °C. Both the heterocycles can be easily assembled via double dehydrogenative coupling, starting from 2-aminobenzyl alcohol/1-phenylethanol and diamine/diol, respectively, in a shorter span of reaction time. This environmentally benign synthetic protocol employing an inexpensive catalyst can rival many other transition-metal systems that have been developed for the fabrication of two putative heterocycles. Mechanistically, the dehydrogenation of secondary alcohol follows clean pseudo-first-order kinetics and exhibits a sizable kinetic isotope effect. Intriguingly, this catalyst provides an example of storing the trapped hydrogen in the ligand backbone, avoiding metal-hydride formation. Easy regeneration of the oxidized form of the catalyst under aerobic/O2 oxidation makes this protocol eco-friendly and easy to handle.
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