Remarkable Effect of Alkalis on the Chemoselective Hydrogenation of Functionalized Nitroarenes over High-Loading Pt/FeO₅ Catalysts


**Chemoselective Hydrogenation of Functionalized Nitroarenes to Anilines**

**Significance:** A sodium-containing FeO₅-supported platinum catalyst (Na-Pt/FeO₅) was prepared by mixing H₂PtCl₆ and Fe(NO₃)₃ with (NH₄)₂CO₃ in water, followed by the treatment with NaNO₃, calcination, and reduction with hydrogen (eq. 1). Na-Pt/FeO₅ catalyzed the chemoselective hydrogenation of substituted nitroarenes under hydrogen pressure to afford the corresponding anilines in 95–97% yield (eq. 2). In the hydrogenation of 3-nitrostyrene, Na-Pt/FeO₅ promoted the hydrogenation of the nitro group to give 3-aminostyrene in 95% conversion with 98% selectivity (eq. 3). The catalyst was reused three times without significant loss of its catalytic activity or chemoselectivity.

**Comment:** Other alkali-metal-containing Pt/FeO₅ catalysts (Li-Pt/FeO₅ and K-Pt/FeO₅) also promoted the selective hydrogenation of 3-nitrostyrene to 3-aminostyrene in 96 to >99% conversion and 94–95% selectivity. Compared with alkali-metal-containing catalysts, alkali-metal-free Pt/FeO₅ showed a lower selectivity (99% conversion and 66% selectivity). The authors have previously reported the chemoselective hydrogenation of functionalized nitroarenes to the corresponding anilines by using FeO₅-supported platinum catalysts prepared from H₂PtCl₆, Fe(NO₃)₃, and Na₂CO₃ (Nat. Commun. 2014, 5, 5634).

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SYNFACTS 2017, 13(10), 1095 Published online: 18.09.2017 DOI: 10.1055/s-0036-1591291; Reg-No.: Y12617SF