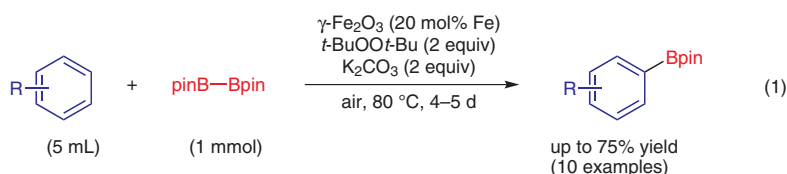


Direct Borylation of Arenes Catalyzed by γ -Fe₂O₃

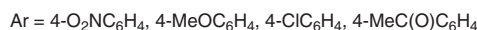
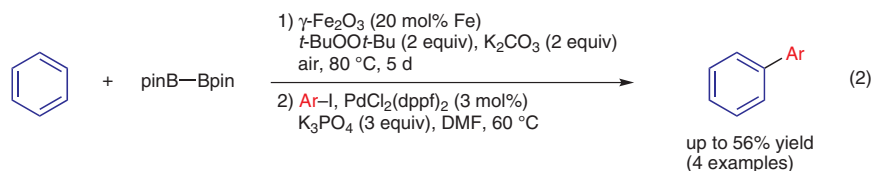


Typical results:

Substrate	Product	Yield (%)	Substrate	Product	Yield (%)
		75			63
		70			67
		32			41

(o/m/p = 61:29:1)

(o/m/p = 71:20:9)



Significance: γ -Fe₂O₃ magnetic nanoparticles (particle size 58 nm) catalyzed the borylation of arenes with bis(pinacolato)diborane in the presence of di-*tert*-butyl peroxide and potassium carbonate under air to give the corresponding borylated products in up to 75% yield (10 examples, eq. 1). A sequential reaction via γ -Fe₂O₃-catalyzed borylation of benzene and Suzuki–Miyaura coupling with iodoarenes gave the corresponding biaryls in up to 56% yield (4 examples, eq. 2).

Comment: The catalytic activity of γ -Fe₂O₃ was superior to that of the other iron catalysts, such as FeCl₃, FeBr₃, FeF₃, Fe(acac)₃, Fe₂(SO₄)₃, and Fe₂O₃. In the borylation of toluene and anisole, the *ortho*-borylated products were obtained as major regioisomers.