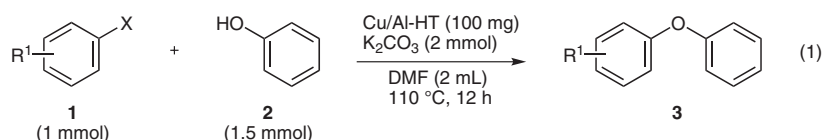
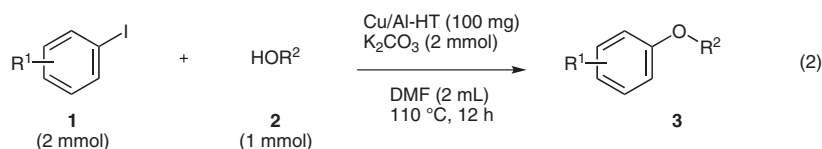


Copper/Aluminum Hydrotalcite Catalyzed O-Arylation of Phenols/Alcohols with Aryl Halides



$R^1 = \text{H, X = I}$ (97% yield) $R^1 = 4\text{-Cl, X = I}$ (89% yield)
 $R^1 = \text{H, X = Br}$ (65% yield) $R^1 = 4\text{-Br, X = I}$ (85% yield)
 $R^1 = \text{H, X = Cl}$ (47% yield) $R^1 = 4\text{-F, X = I}$ (78% yield)
 $R^1 = 4\text{-NO}_2, \text{X = I}$ (96% yield) $R^1 = 4\text{-Cl, X = Br}$ (97% yield)
 $R^1 = 2\text{-NO}_2, \text{X = I}$ (69% yield) $R^1 = 4\text{-CO}_2\text{Et, X = I}$ (92% yield)
 $R^1 = 4\text{-NO}_2, \text{X = Cl}$ (82% yield) $R^1 = 4\text{-OMe, X = I}$ (97% yield)



$R^1 = \text{H, R}^2 = \text{Ph}$ (97% yield) $R^1 = \text{H, R}^2 = 3,4\text{-Me}_2\text{C}_6\text{H}_3$ (85% yield)
 $R^1 = \text{H, R}^2 = 4\text{-ClC}_6\text{H}_4$ (57% yield) $R^1 = \text{H, R}^2 = 2\text{-Naph}$ (94% yield)
 $R^1 = \text{H, R}^2 = 4\text{-FC}_6\text{H}_4$ (83% yield) $R^1 = 4\text{-NO}_2, \text{R}^2 = \text{Bn}$ (93% yield)
 $R^1 = \text{H, R}^2 = 4\text{-MeC}_6\text{H}_4$ (97% yield) $R^1 = 4\text{-NO}_2, \text{R}^2 = \text{Cy}$ (86% yield)
 $R^1 = \text{H, R}^2 = 4\text{-MeOC}_6\text{H}_4$ (85% yield) $R^1 = 4\text{-MeO, R}^2 = \text{Cy}$ (91% yield)
 $R^1 = \text{H, R}^2 = 4\text{-EtO}_2\text{CC}_6\text{H}_4$ (78% yield) $R^1 = 4\text{-Br, R}^2 = 4\text{-BrC}_6\text{H}_4$ (85% yield)
 $R^1 = \text{H, R}^2 = 4\text{-PhC}_6\text{H}_4$ (92% yield) $R^1 = 4\text{-NO}_2, \text{R}^2 = 4\text{-MeOC}_6\text{H}_4$ (91% yield)
 $R^1 = \text{H, R}^2 = 4\text{-t-BuC}_6\text{H}_4$ (97% yield) $R^1 = 4\text{-MeO, R}^2 = 4\text{-BrC}_6\text{H}_4$ (89% yield)

Significance: Copper/aluminum hydrotalcite (Cu/Al-HF, Cu:Al = 2.5:1, 34.94 atm% Cu) was found to catalyze O-arylation of various phenols and alcohols **2** with aryl halides **1**. Thus, the reaction of **1** with **2** was carried out in the presence of Cu/Al-HF and K_2CO_3 in DMF to give the corresponding aryl ethers **3** in 47–97% yield. The Cu/Al-HF catalyst was recovered by filtration and reused four times with slight loss of catalytic activity.

Comment: The Cu/Al-HF catalyst has been developed by Velu and Swamy (S. Velu, C. S. Swamy *Appl. Catal., A: Gen.* **1996**, 145, 141; see also: M. L. Kantam et al. *Org. Lett.* **2008**, 10, 2979). The authors reported the Cu/Al-HT catalyzed N-arylation of amines with aryl chlorides (P. R. Likhar, R. Arundhathi, M. L. Kantam *Tetrahedron Lett.* **2007**, 48, 3911) and the copper fluoroapatite catalyzed N-arylation of N-heterocycles with chloro- and fluoroarenes (B. M. Choudary, C. Sridhar, M. L. Kantam, G. T. Venkanna, B. Sreedhar *J. Am. Chem. Soc.* **2005**, 127, 9948).