REACTIONS OF PROPARGYL ALCOHOL WITH ARYL IODIDES CATALYZED BY PALLADIUM COMPLEXES IN WATER

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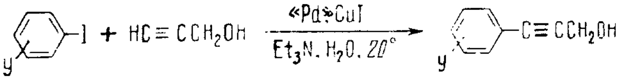
The cross-coupling of propargyl alcohol with aryl iodides proceeds under mild conditions in the presence of base, CuI, and palladium complexes in various solvents such as Et_2NH, benzene, chloroform, and DMF [1,2]. Subsequent oxidation and decarboxylation of the 3-arylpropargyl alcohols formed leads to arylacetylenes [2].

We have found that this reaction may be carried out in water. Best results were obtained using $PdCl_2[PPh_2(m\text{-}C_6H_4SO_3Na)]_2$ as the catalyst in the presence of two equivalents of PPh_3 and triethylamine as the base.



The reaction is complete after 1 h at 25°C using 0.8 mole/liter ArI and ArI:HC≡CCH_2OH:-Et_3N = 1:1.5:2.5 (1 mole % "Pd" and 3 mole % CuI) and leads to 3-arylpropargyl alcohols in high yield. Water-soluble iodobenzoic acids in the presence of base as well as water-soluble aryl iodides undergo this reaction. The yields of the cross-coupling products isolated were as follows in % (Y): 78 (p-CO_2H), 80 (m-CO_2H), 69 (p-NO_2), 70 (p-MeCO). The yield of the cross-coupling products is lower with other palladium catalysts ($Pd(OAc)_2$ and $PdCl_2(PPh_3)_2$) in the presence of Et_3N, Na_2CO_3, K_2CO_3, or NaOH in water or aqueous DMF.

LITERATURE CITED

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