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**LA CHIMICA GUIDA LO
SVILUPPO SOSTENIBILE**

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Ligand-Free Cobalt-Catalyzed Cross-Coupling Reaction Between Organoaluminum Reagents and (Hetero)Aryl and Alkyl Bromides

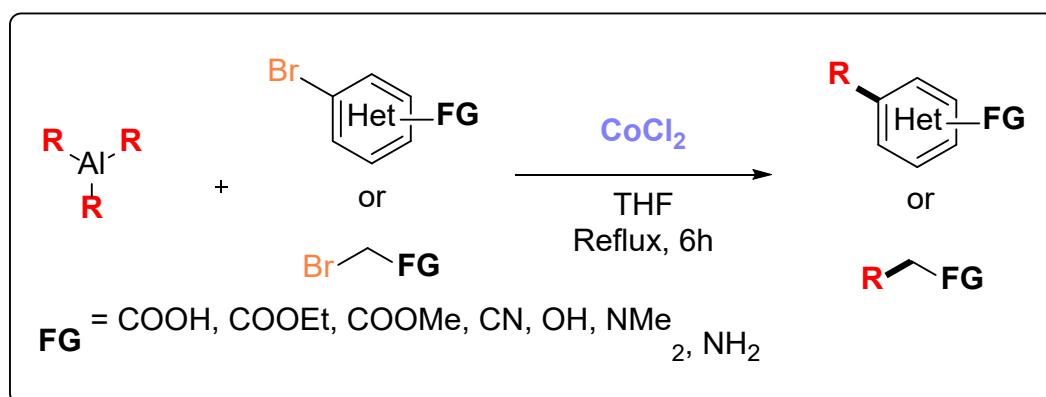
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Transition-metal catalyzed cross-coupling reactions are some of the most important C–C bond-forming protocols and have been widely applied both in academic research and in industry. Since the discovery of cross-coupling reactions in the early 1970's, a great number of catalytic systems using organoboron, organotin, organosilicon, organozinc or organozirconium, and organomagnesium as coupling reagents have been developed. In contrast, coupling reactions employing organoaluminum reagents are very rare. These reagents exhibited high chemoselectivity and good compatibility of functional groups in C–C bond formation reactions. Moreover, aluminum exhibits low toxicity and is one of the most inexpensive and earth-abundant metals. [1, 2] As part of our current research interest in developing new catalytic synthetic methodologies, [3, 4] in this communication we report a very general, cobalt catalyzed cross coupling reaction between alkyl- and aryl-aluminum compounds with alkyl- and (hetero)aryl bromides, affording the C(sp²)–C(sp²) and C(sp³)–C(sp²) cross-coupled products in good to excellent yields.

Catalyzed by the cheap and commercially available CoCl₂, without external ligands or bases, the reactions proceed smoothly with a wide range of substituted bromides, decorated by electro-donating and electro-withdrawing group, providing a versatile methodology for cobalt-mediated cross-coupling processes.



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[2] B. Shrestha, S. Thapa, S. K. Gurung, R. A. S. Pike, R. Giri. *J Org Chem.* 2016; 81, 787.

[3] F. Messa, S. Perrone, M. Capua, F. Tolomeo, L. Troisi, V. Capriati, A. Salomone. *Chem. Commun.* 2018, 54, 8100 – 8103

[4] F. Messa, G. Dilauro, F. M. Perna, P. Vitale, V. Capriati, A. Salomone. *ChemCatChem.* 2020, 12, 1979 - 1984

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