Direct Cross-Coupling of Organoaluminum Reagents

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\begin{align*}
\text{AlMe}_2\cdot\text{LiCl} & \quad + \quad \text{R}^2-X \\
(2.5 \text{ equiv}) & \quad \text{THF, 110 °C, 24 h} \\
\text{R}^1 & = \text{Me, F, NMe}_2, \text{OEt, CH}_2\text{OEt} \\
\text{R}^2 & = \text{Ar, alkenyl, alkynyl} \\
X & = \text{I, Br, Cl} \\
63–99\% \text{ yield}
\end{align*}
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Significance: The authors report a direct cross-coupling of arylaluminum reagents and organic halides without an external catalyst. As the steric and electronic properties of functional groups on the aromatic ring had little influence of the reactivity, a variety of coupling products were obtained in high yields.

Comment: Interestingly, the reactions of aromatic iodides or bromides bearing a tosylate, triflate, or carbamate group did show high chemoselectivity, as the coupling only took place at the halide. Additionally, an ICP-MS analysis was performed to exclude traces of transition metals (level of 1 ppb).