The First Csp²-Csp² Cross-Coupling Using Organozinc Reagents

Significance: In 1977, Negishi and co-workers described the first transition-metal-catalyzed cross-coupling using aryl- and benzyllzinc reagents with substituted aryl halides. Two catalytic systems using either nickel or palladium salts in combination with PPh₃ were developed leading to the coupling products in high yields.

Comment: In comparison to the corresponding magnesium-based organometallics, the use of organozinc species enables the coupling of aryl halides bearing sensitive functional moieties, such as ester, nitrile, or even nitro groups. Due to the low toxicity of organozinc reagents, and the mild conditions required for the cross-coupling, their application in academic and industrial research remains a growing field.