

Titanium, a plentiful and non-toxic transition metal, is often used in modifying organolithium and organomagnesium compounds. Titanium reagents are typically prepared by ligand exchange reactions using TiCl_4 , $\text{Ti}(\text{O}i\text{Pr})_4$, or cyclopentadienyl-titanium trichloride. Chloride ligands can be substituted with various ligands, including protonated, silylated, stannylated, or metalated ones. Volatile byproducts are removed through evaporation, while alkoxide ligands can be exchanged by forming adducts with alcohols. Many titanium compounds are sensitive to moisture, reacting to form acidic hydroxo compounds which then dimerize or trimerize into μ -oxo structures. Excess water leads to complete hydrolysis, producing titanium dioxide. This section highlights recent advancements in utilizing organotitanium compounds for organic synthesis.