IV. Addition of Tin- and Silicon-Centered Radicals to Aldehydes

Although the reactions discussed thus far have involved addition of carbon-centered radicals to carbonyl groups, other types of radicals, including tin- and silicon-centered ones, also add to aldehydes and ketones. Reaction of the tri-*n*-butyltin radical with a carbonyl group generates a tin ketyl, a radical with considerable negative charge on the oxygen atom. As the reaction in Scheme 9[18] shows, tin ketyls undergo internal radical addition to electron-deficient, C–C multiple bonds.[18–22] These ketyls also react with C–N double bonds,[23] and they produce pinacols upon addition to carbonyl groups (eq 8).[24] Internal addition also can occur when a silicon-centered radical adds to an aldehydo group, as happens in the reaction shown in eq 9.[25]

Scheme 9