

Renaissance of early main group organometallic chemistry

Sjoerd Harder

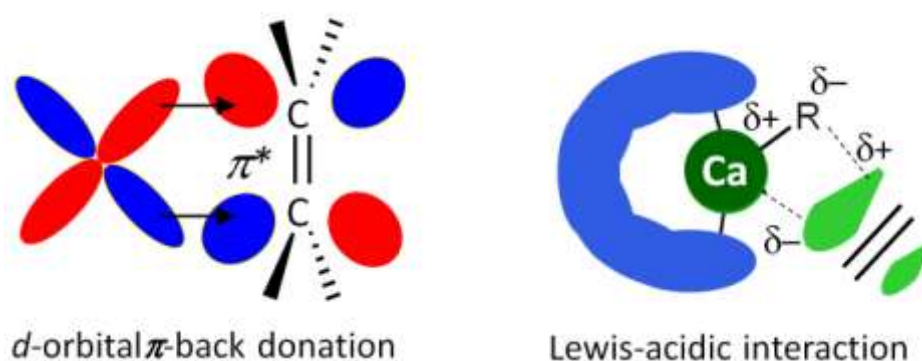
Chair Inorganic Chemistry, Friedrich Alexander University Erlangen-Nürnberg,
Egerlandstrasse 1, 91058 Erlangen, Germany

sjoard.harder@fau.de

Although classical early main group organometallic compounds like BuLi or Grignard reagents play a key role in synthetic organic chemistry, other applications of these strongly nucleophilic reagents are scarce. The *d*-block metals receive much larger research interest. On behalf of their *d*-orbitals they display interesting magnetic and electronic properties and manifold reactivity which can be exploited in catalysis. Only the last decade has seen already three Nobel prizes related to transition metal catalysis.

This lecture will discuss differences but also analogies between early main group metal chemistry and *d*-block chemistry. Despite the lack of low-lying valence *d*-orbitals, organocalcium reagents can be useful catalysts that show a unique reactivity which is complementary rather than competitive to *d*-block catalysis [1]. Substrate activation proceeds through Lewis-acidic interaction rather than π -backbonding bond activation (Figure 1). Apart from catalysis also other applications of early main group metal chemistry, *e.g.* in hydrogen storage, will be discussed [2].

Figure 1. C=C bond activation by transition metals and main group metals



1. S. Harder, *Chem. Rev.* **2010**, *110*, 3852-3876.
2. J. Spielmann, J. Intemann, H. Bandmann, S. Harder, *Angew. Chem. Int. Ed.* **2011**, *123*, 4242-4246.