

Lecture “Modern Synthetic Methods”

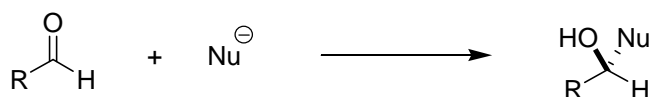
Take-home messages from Week 11

3.2.4. Preparation of Organometallic Reagents

- **Halogen-metal exchange:** e.g. Li, Mg
- **Directed metallation:** e.g. Li
- **Oxidative Addition:** Main group and transition metals, i.e. Pd
- **Transmetallation:** Main group to transition metals, i.e. cuprates
- **Hydrometallation:** e.g. B, Zr

3.3. Metals as Lewis acids

3.3.1. Activation of substrates – Enantioselective Catalysis

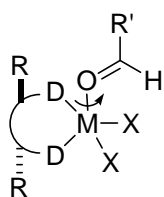


- Activation of **electrophile**: Increase of electrophilicity → (Chiral) **Lewis acids**
- Activation of **nucleophile**: Increase of nucleophilicity → (Chiral) **Lewis bases**
- Activation of both **electrophile and nucleophile**: Combination of both **Lewis acid and Lewis base**

3.3.2. Electrophile activation

I) One point binding:

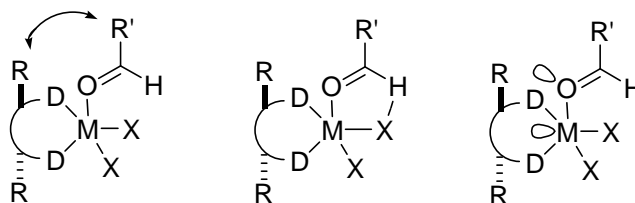
General applicability but difficult design



Problem: Rotation around M-O bond

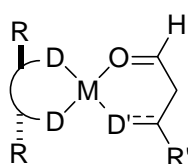
Solutions:

- Leave no space
- Hydrogen bonding
- π -Stacking
- Stereoelectronic effects



II) Two-point binding:

Simple catalyst design but limited substrate scope



- Additional entropic activation
- Complex geometry around metal crucial