**Preparation of Alkylmagnesium Reagents from Alkenes through Hydroboration and Boron–Magnesium Exchange**


---

**Alkylmagnesium Reagents from Boron–Magnesium Exchange**

**Significance:** A novel method for preparing alkylmagnesium reagents has been disclosed. Alkenes undergo a hydroboration with subsequent boron–magnesium exchange to yield the corresponding primary and secondary alkylmagnesium reagents. These organometallic reagents can be used in a wide range of carbon–carbon bond-forming reactions.

**Comment:** The key for an efficient boron–magnesium exchange is the use of a pinacolborolane and a 1,4-dimagnesium reagent. The byproducts formed in the course of the exchange reaction did not disturb various subsequent reactions like alkylations, 1,2-additions as well as transition-metal-catalyzed cross-coupling reactions.

**Selected products obtained after trapping of prepared alkylmagnesium reagents:**

- \( R = \text{n-Oct} \) Ph: 94% yield
- \( R = \text{n-Oct} \) OH: 92% yield
- \( R = \text{n-Oct} \) \( \text{Ph} \): 91% yield
- \( R = \text{n-Oct} \) Ph: 91% yield
- \( \text{n-Oct} \) \( \text{CO}_2\text{Et} \): 84% yield
- \( \text{TIPSO} \) \( \text{CO}_2\text{Et} \): 83% yield
- \( \text{Ph} \) \( \text{CO}_2\text{Et} \): 86% yield
- \( \text{Ph} \) \( \text{CO}_2\text{Et} \): 76% yield

\( R = \) various primary and secondary Alk
\( E = \) various electrophiles

---

**SYNFACTS Contributors:** Paul Knochel, Andreas K. Steib

Synfacts 2012, 8(8), 0889  Published online: 19.07.2012

DOI: 10.1055/s-0032-1316629; Reg-No.: P08112SF

---

Category: Metal-Mediated Synthesis

Key words: boranes, C–C coupling, Grignard reaction