
Copper-Catalyzed Cross-Coupling of Nonactivated Secondary Alkyl Halides and Tosylates with Secondary Alkyl Grignard Reagents


**Cu-Catalyzed Coupling of Secondary Alkyl Electrophiles and Alkyl Grignards**

![Reaction Scheme](image)

**Selected examples:**

- **81% yield**
  - $X = OTs$
  - 89% yield
  - $X = Br$

- **74% yield**
  - $X = Br$

- **64% yield**
  - $X = Br$

- **70% yield**
  - 99% ee
  - $X = OTs$

- **67% yield**
  - 98% ee
  - $X = OTs$

**Significance:** A novel method for the cross-coupling of nonactivated secondary alkyl halides and pseudo halides with secondary Grignard reagents with a copper catalyst is described. The addition of TMEDA and LiOMe was found to be crucial for the success of the reaction. A broad range of functional groups including esters, amides and aryl halides, is tolerated under the reaction conditions.

**Comment:** Interestingly, the reaction proceeds according to a classical S$_N$2 mechanism with inversion of configuration. Therefore, easily accessible chiral secondary alcohols can be converted into chiral tosylates and alkylated with a copper catalyst with either primary or secondary alkyl Grignard reagents to furnish the products in high enantiomeric excess.