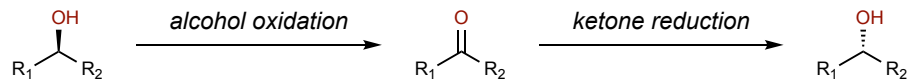
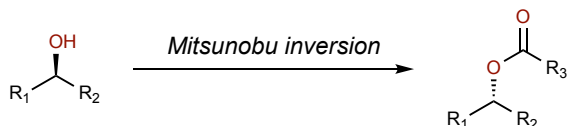


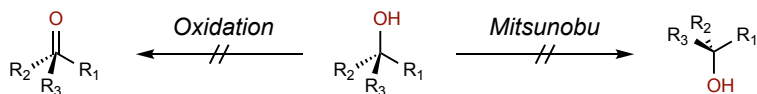
Alcohol Inversion:



Oxidation/reduction sequences are often used to invert alcohols

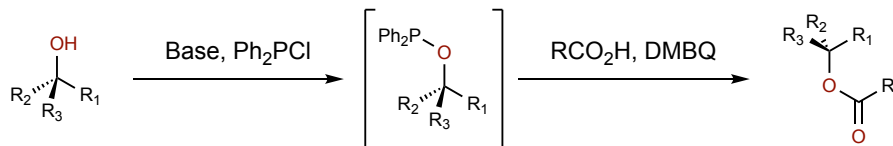


Mitsunobu provides esters with inversion



Both strategies struggle to (or cannot) invert tertiary alcohols.

A Solution? Mukaiyama inversion:

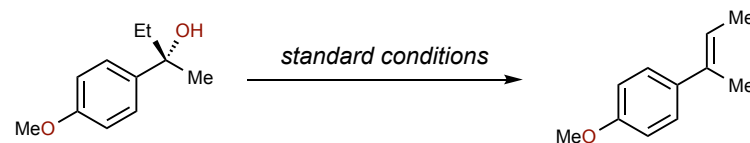
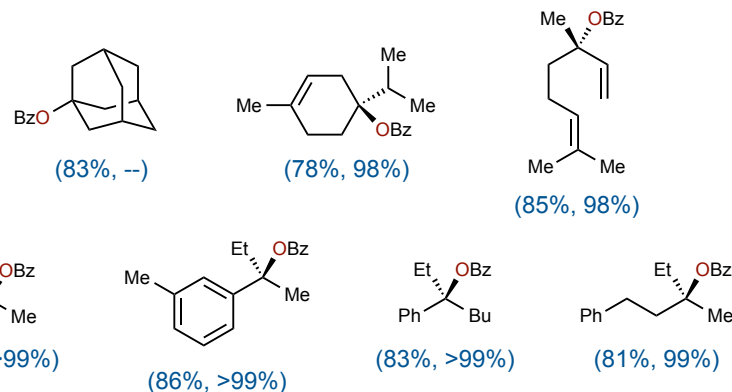
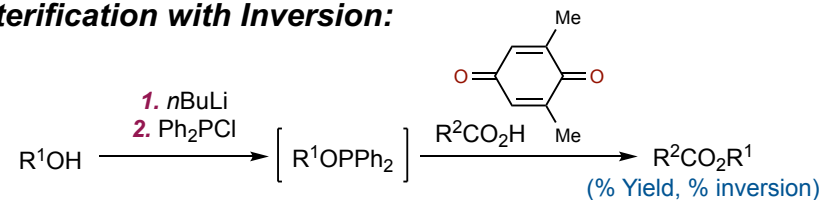


A Convenient Method for the Preparation of Inverted *tert*-Alkyl Carboxylates from Chiral *tert*-Alcohols by a New Type of Oxidation–Reduction Condensation Using 2,6-Dimethyl-1,4-benzoquinone

Teruaki Mukaiyama,* Taichi Shintou, and Kentaro Fukumoto

Original Report – JACS, 2003

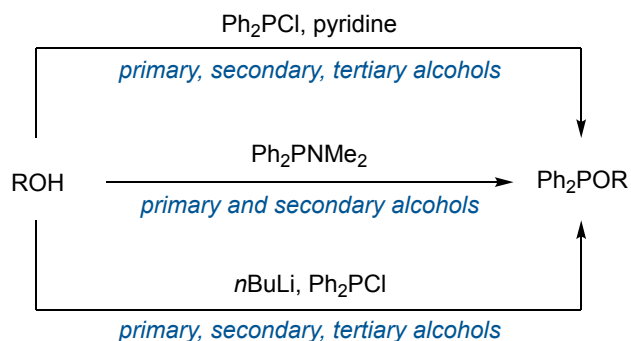
Esterification with Inversion:



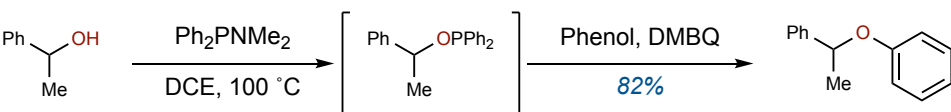
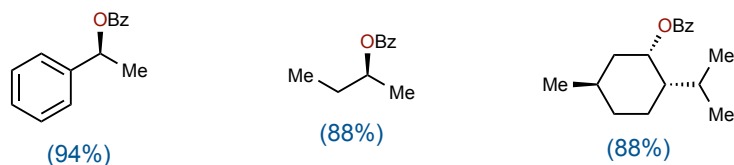
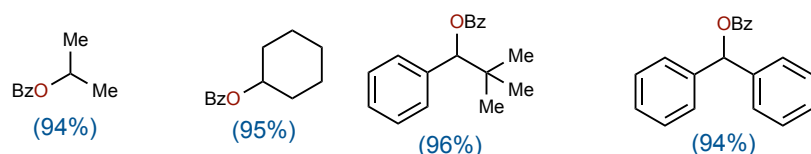
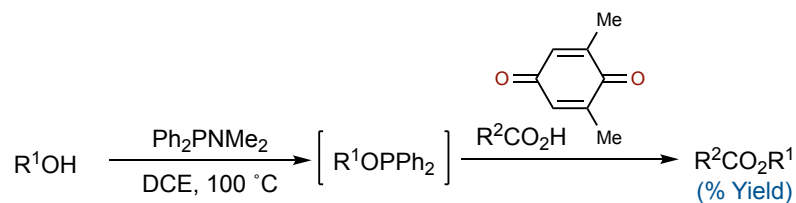
General procedure:

1. Dissolve substrate in THF, add *n*BuLi at 0 °C. Stir 1 hour.
2. Add Ph₂PCI at 0 °C. Stir 1 hour.
3. Remove THF under reduced pressure.
4. Redissolve in DCM, add acid and DMBQ
5. Stir overnight!

Can a different base be used to expand to scope?

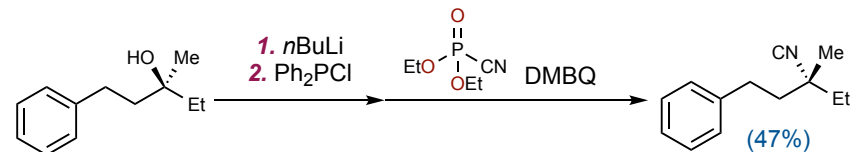
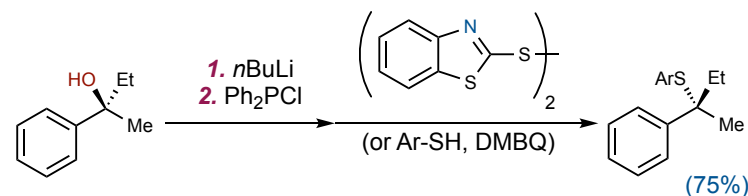
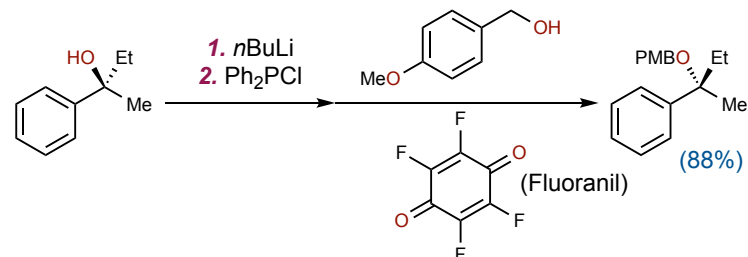


Alternative Alcohol Activation:

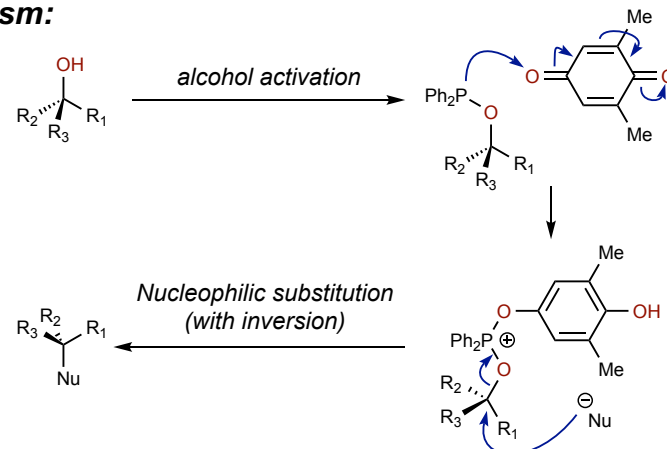


Other Nucleophiles:

In addition to acids and phenols, non-acidic nucleophiles can be used (take that, Mitsunobu!)



Mechanism:



Example in Total Synthesis

