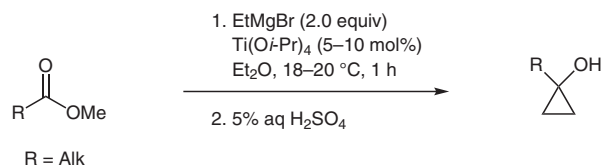


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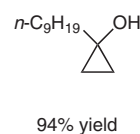
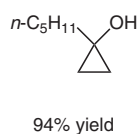
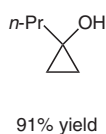
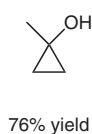
Titanium(IV) Isopropoxide-Catalyzed Formation of 1-Substituted Cyclopropanols in the Reaction of Ethylmagnesium Bromide with Methyl Alkanecarboxylates

*Synthesis* **1991**, 234–234.

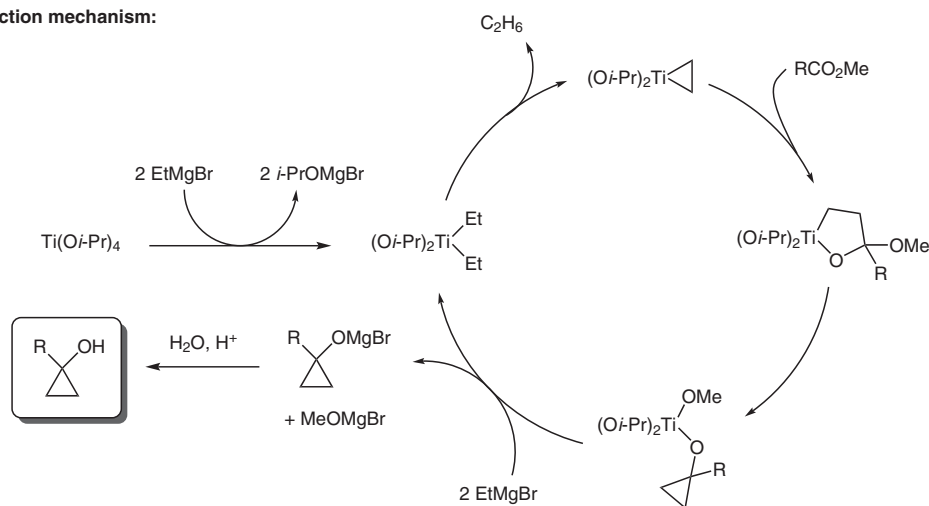
## The Kulinkovich Reaction



### Examples:



### Reaction mechanism:



**Significance:** In 1991, Kulinkovich and co-workers reported the titanium-catalyzed reaction of simple esters with ethylmagnesium bromide, leading to substituted cyclopropanols in excellent yields.

**Comment:** Interestingly, in the presence of the titanium catalyst, ethylmagnesium bromide is transformed into an ethylene dianion, which is reactive towards alkylcarboxylic esters.