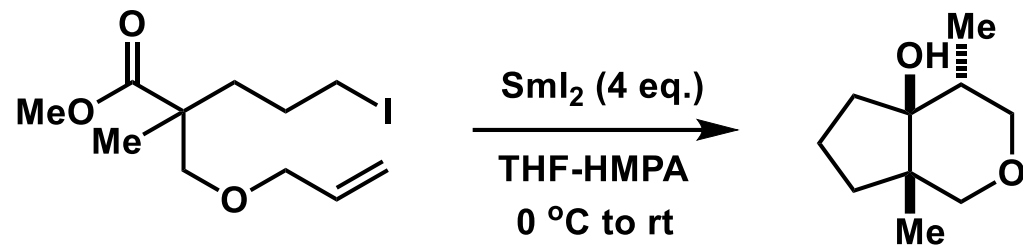
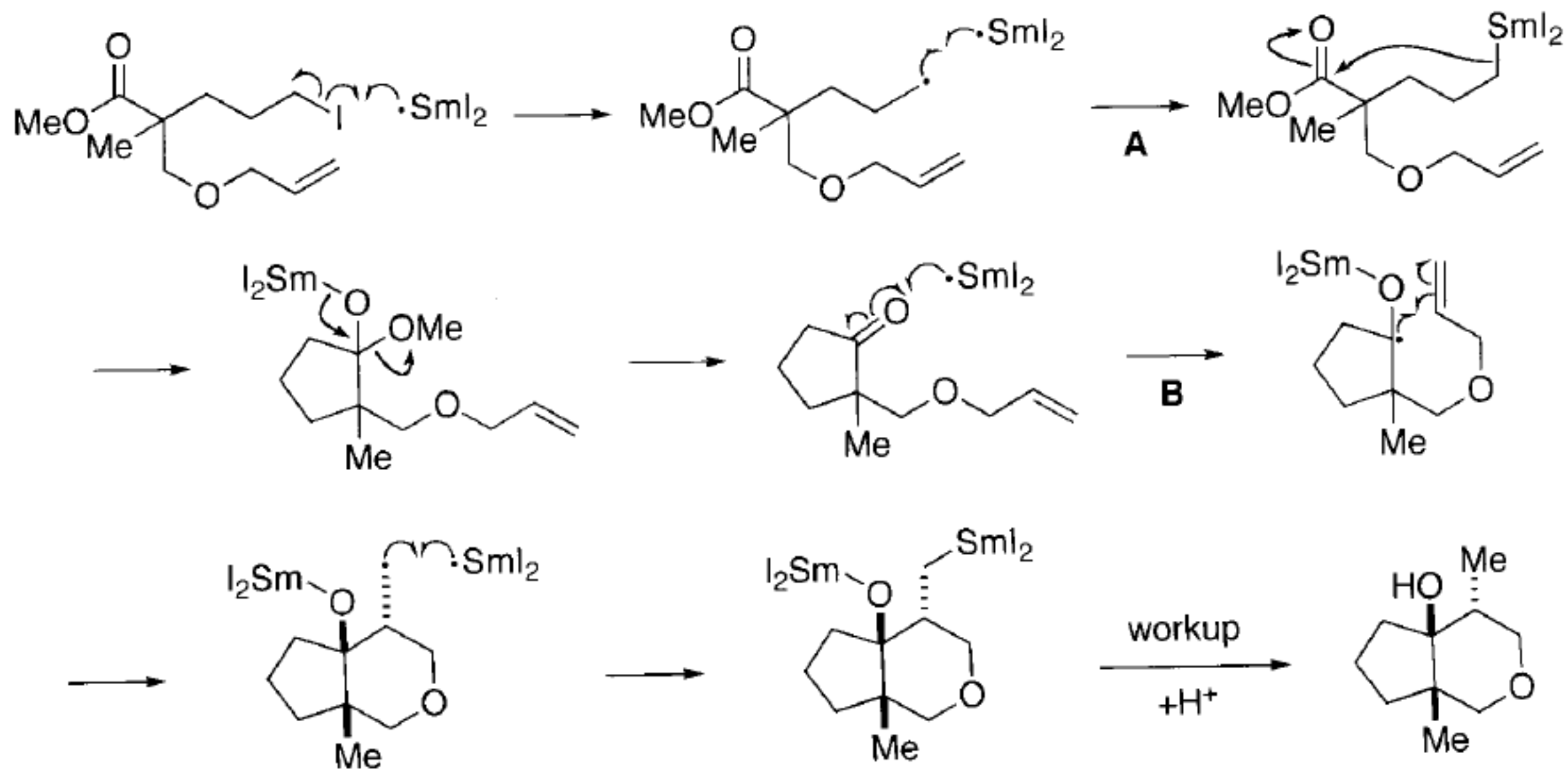


1.





**二碘化钐( $\text{SmI}_2$ ):** 单电子还原剂

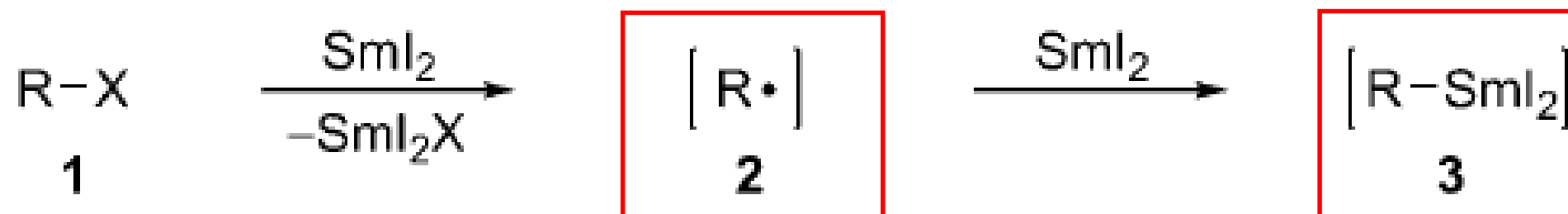
制备:  $\text{Sm} / \text{I}_2$ 、 $\text{Sm} / \text{CH}_2\text{I}_2$ 、 $\text{Sm} / \text{I}(\text{CH}_2)_2\text{I}$ ; 深蓝色溶液

对 $\text{O}_2$ 极为敏感, 严格无氧操作、溶剂脱气

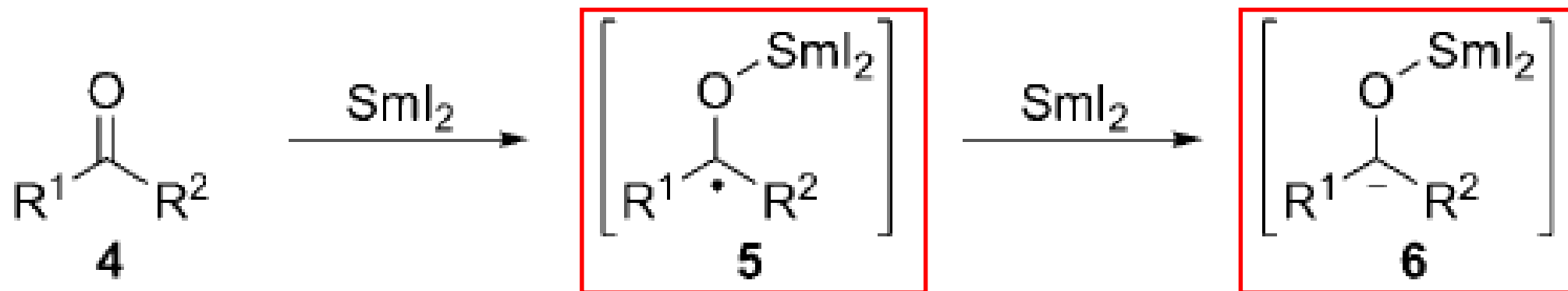
共溶剂/添加剂/质子源:  $\text{HMPA}$ 、 $\text{ROH}$ 、 $\text{H}_2\text{O}$ 、 $\text{TEA}$ 等

与 $\text{O}$ 很容易结合, 反应往往表现出良好的立体选择性

a)  $\text{SmI}_2$ -mediated activation of alkyl halides

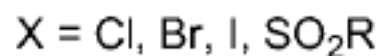
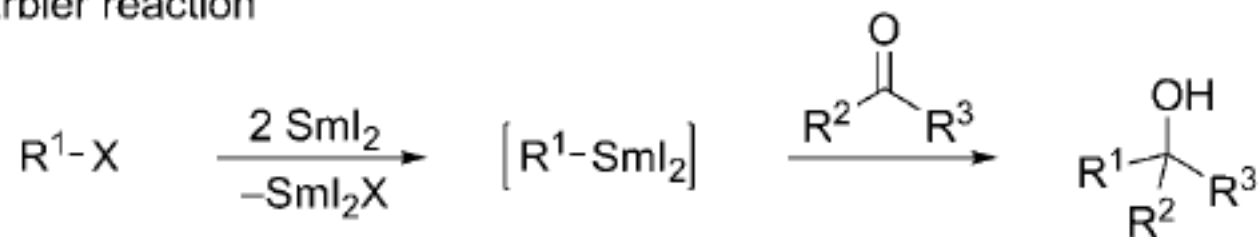


b)  $\text{SmI}_2$ -mediated activation of carbonyl compounds

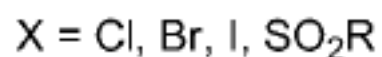
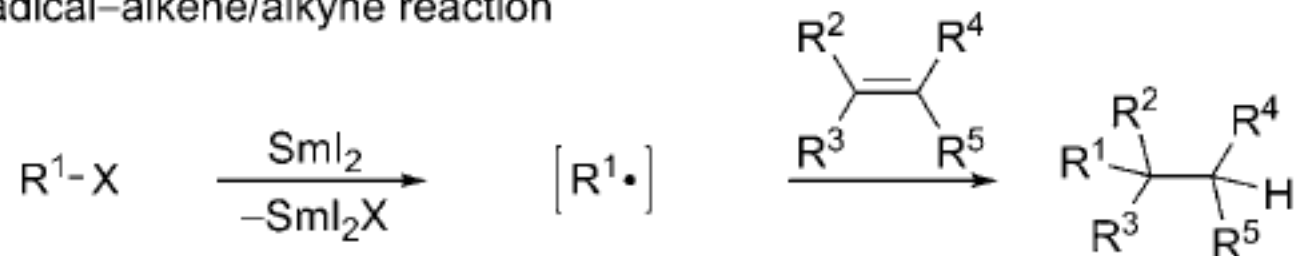


**Scheme 1.** Common mechanisms of  $\text{SmI}_2$ -mediated activation of a) alkyl halides and b) carbonyl compounds.

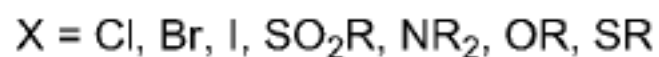
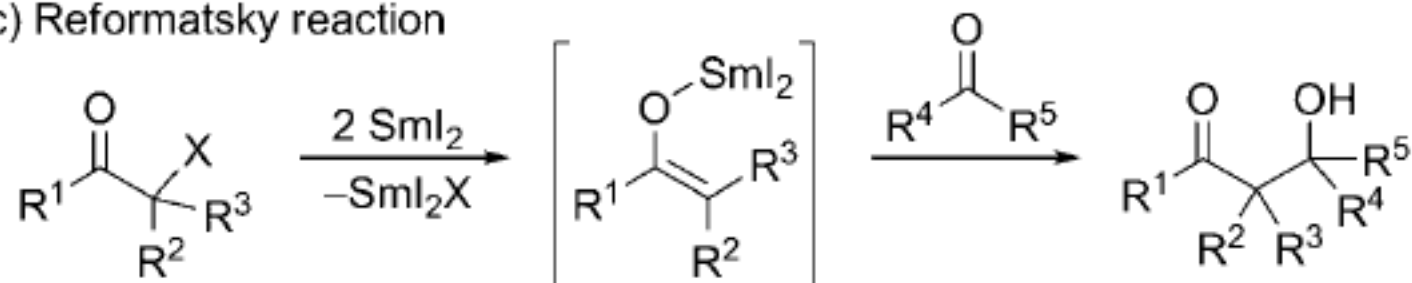
a) Barbier reaction



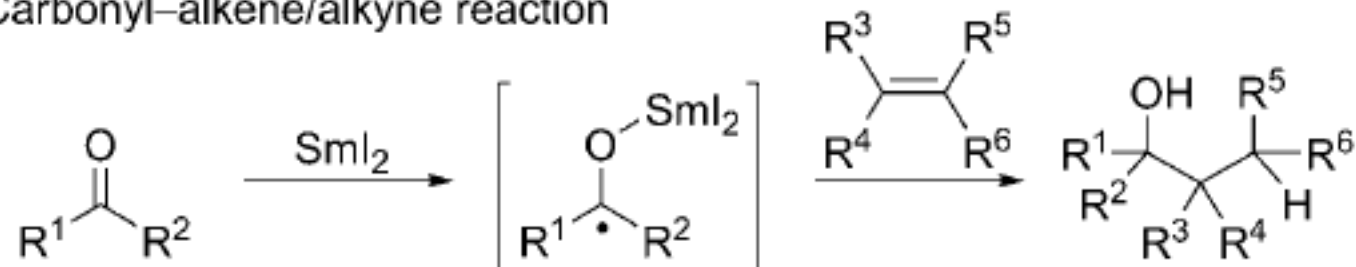
b) Radical-alkene/alkyne reaction



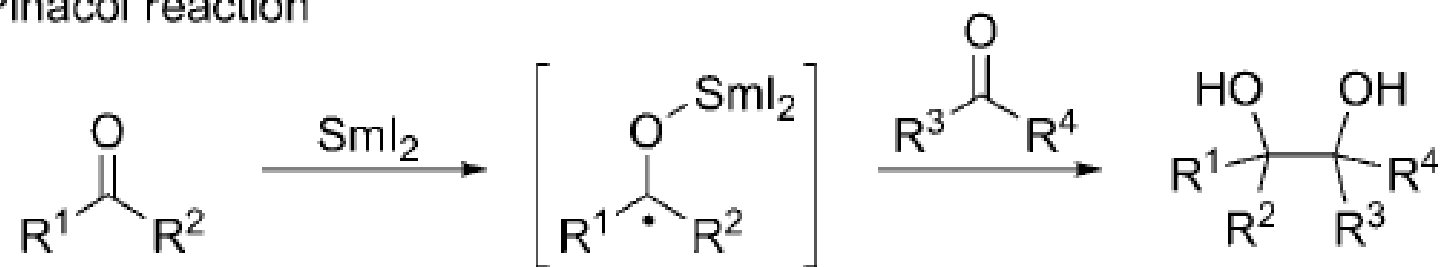
c) Reformatsky reaction



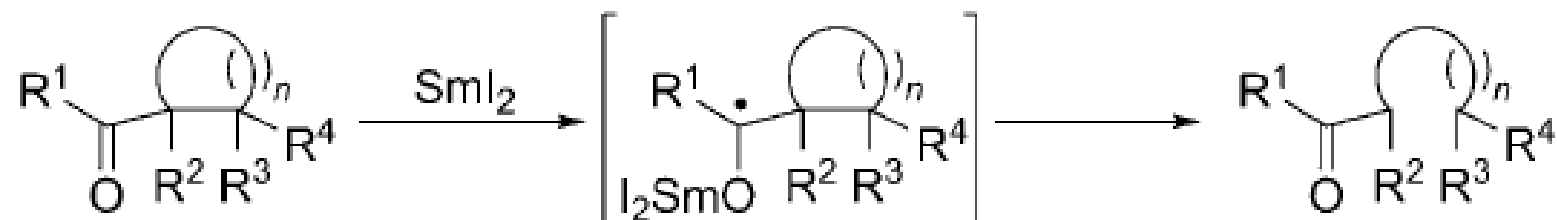
d) Carbonyl-alkene/alkyne reaction



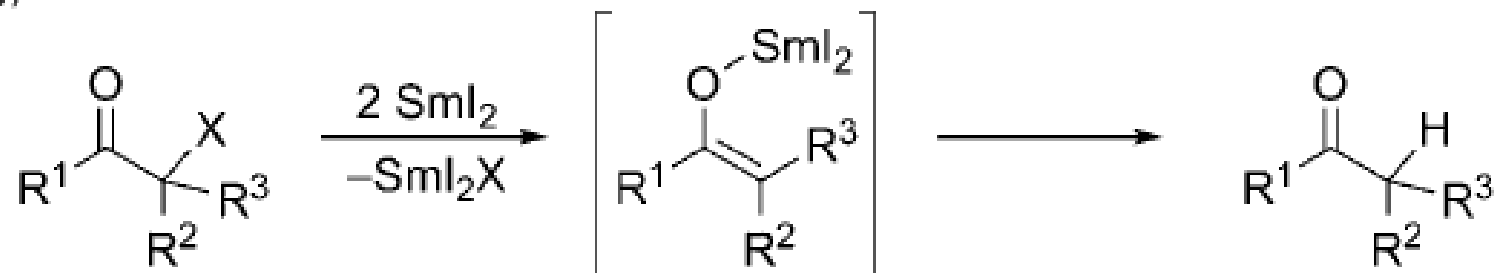
e) Pinacol reaction



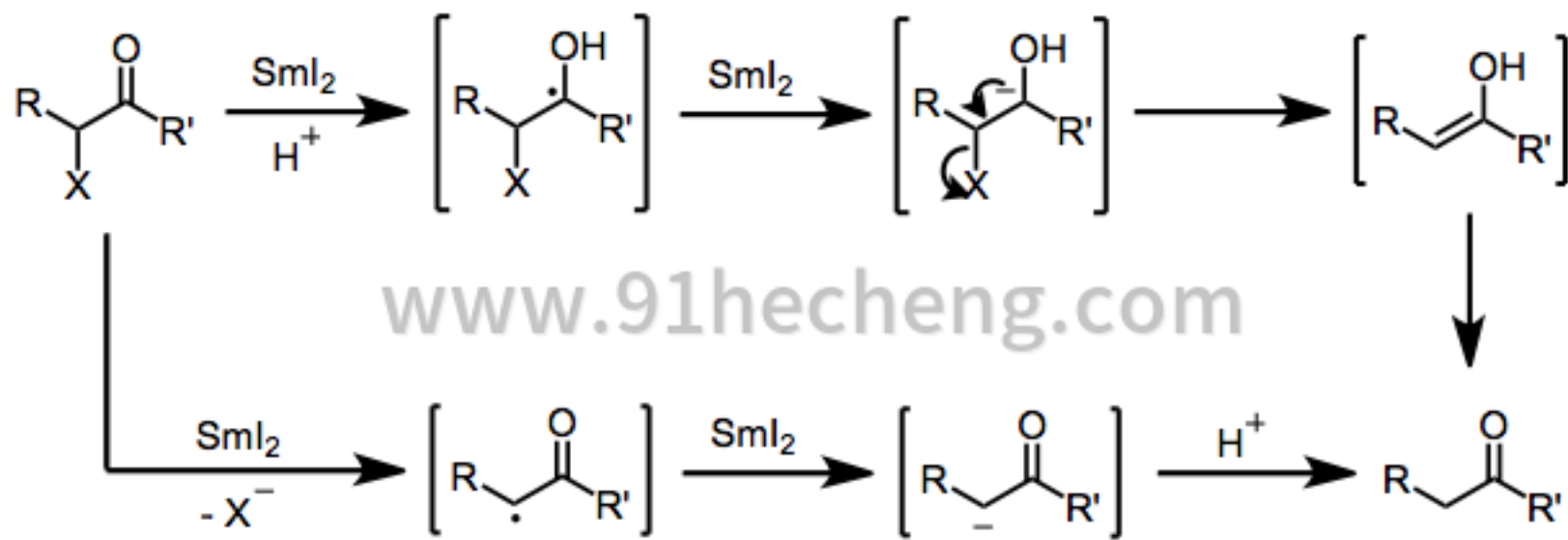
f) Fragmentation reaction



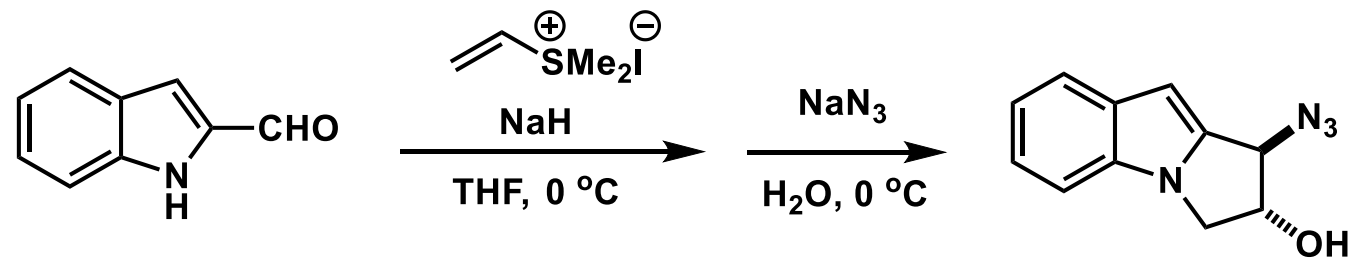
g) Elimination reaction



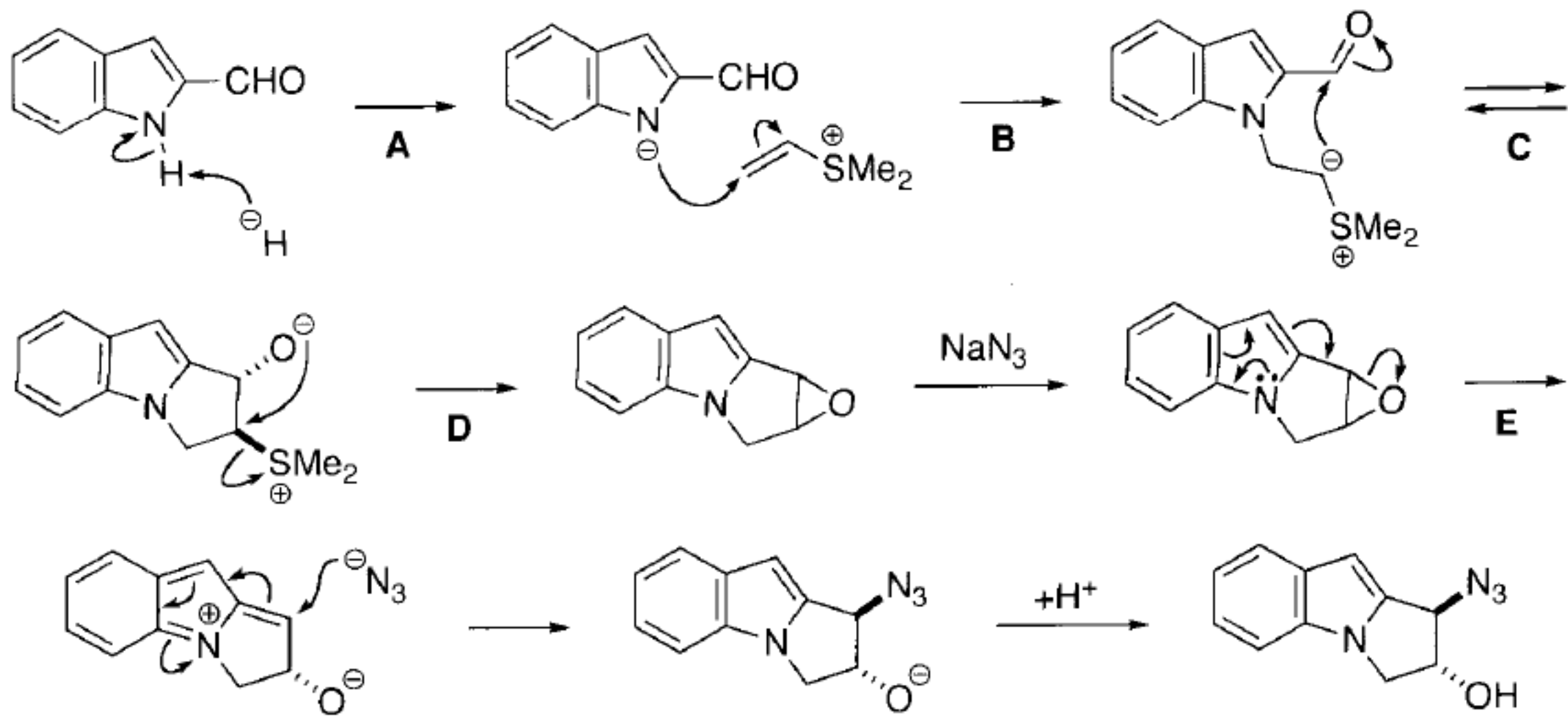
**Scheme 2.** Some representative  $\text{SmI}_2$ -mediated transformations.



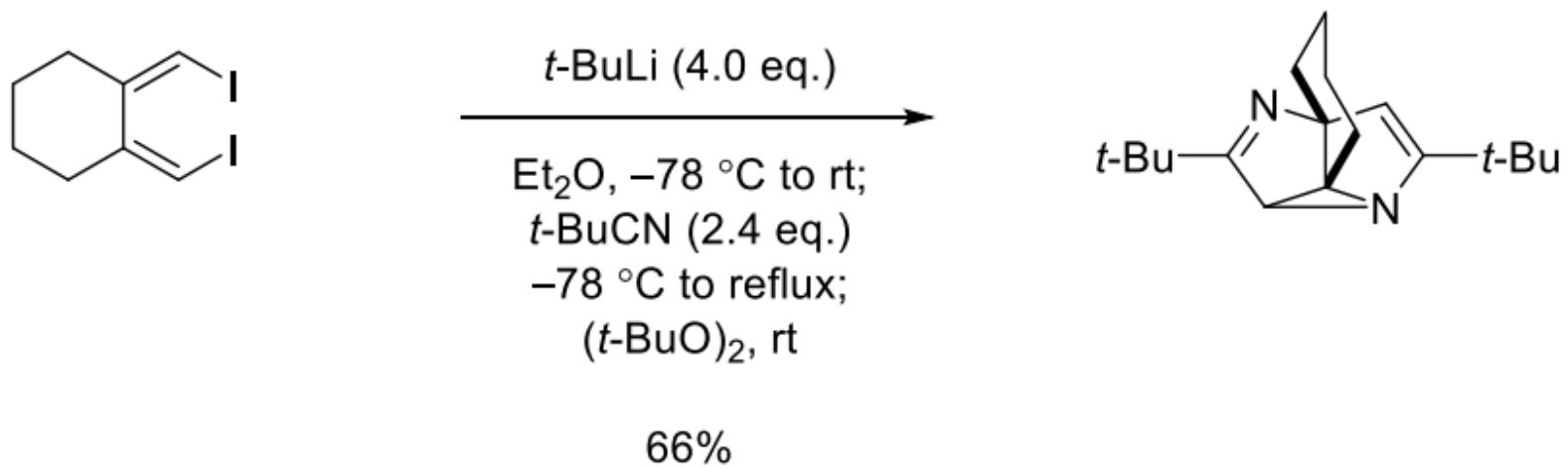
2.



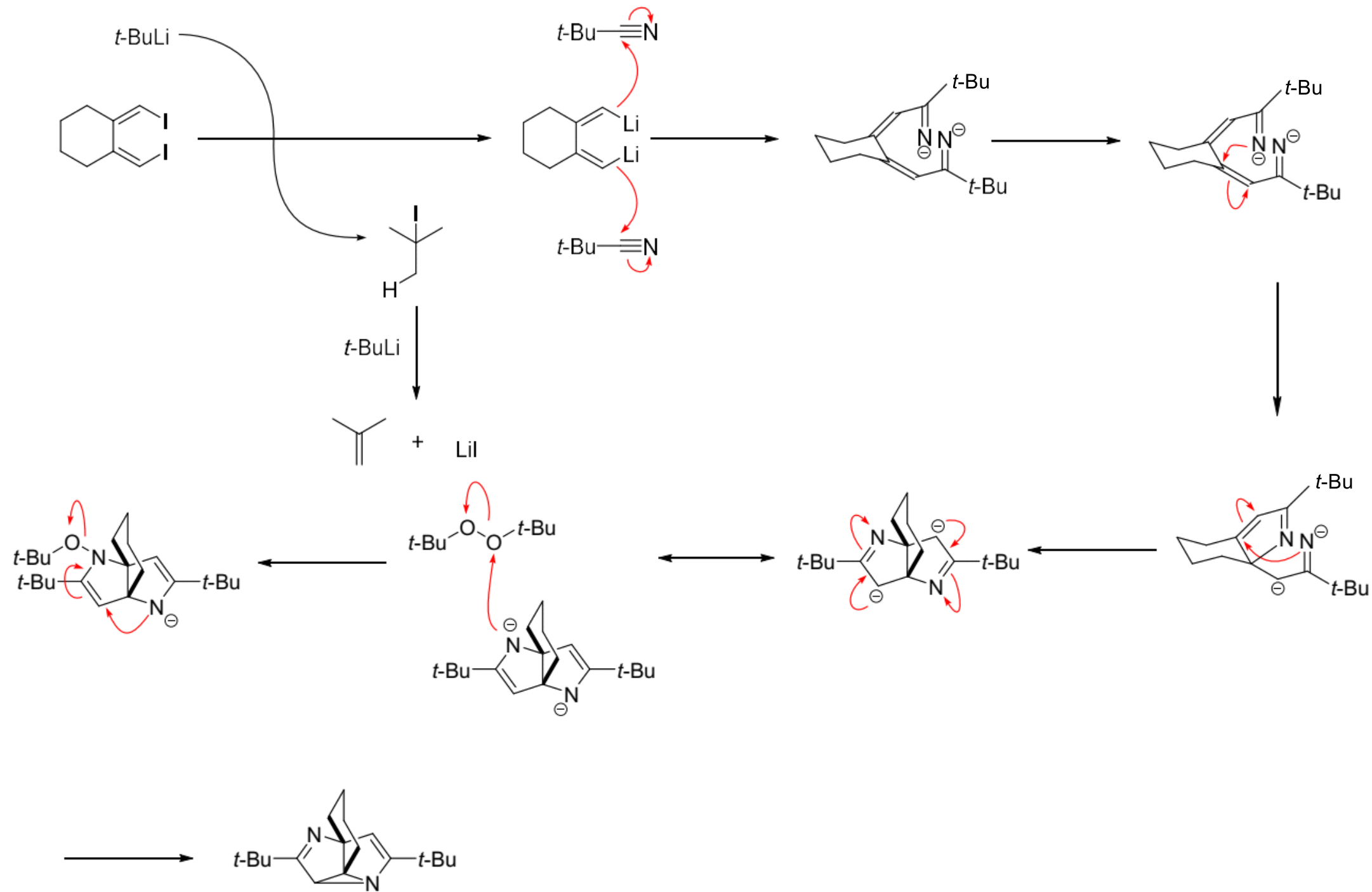




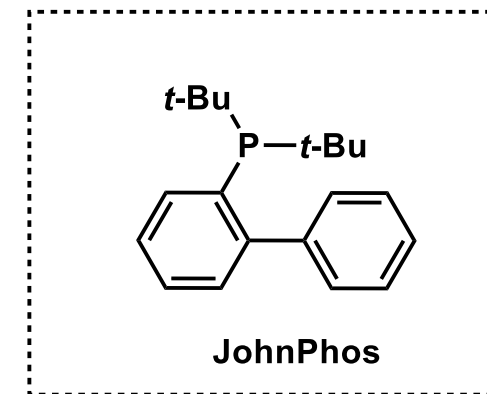
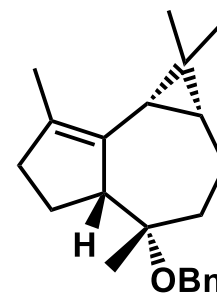
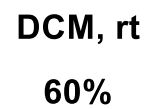
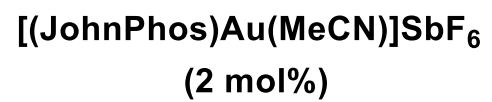
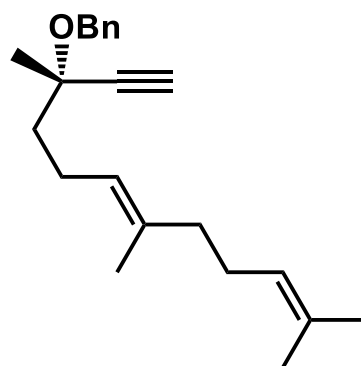
3.



*J. Am. Chem. Soc.* **2012**, *134*, 11964.



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*Angew. Chem. Int. Ed.* **2014**, 53, 4896–4899.

