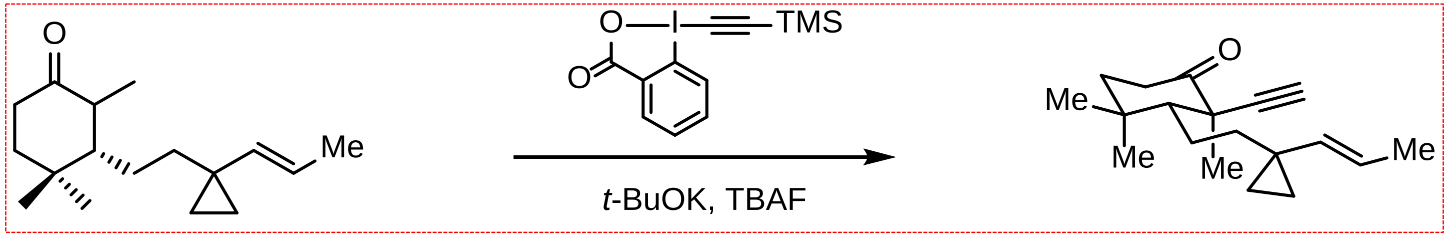
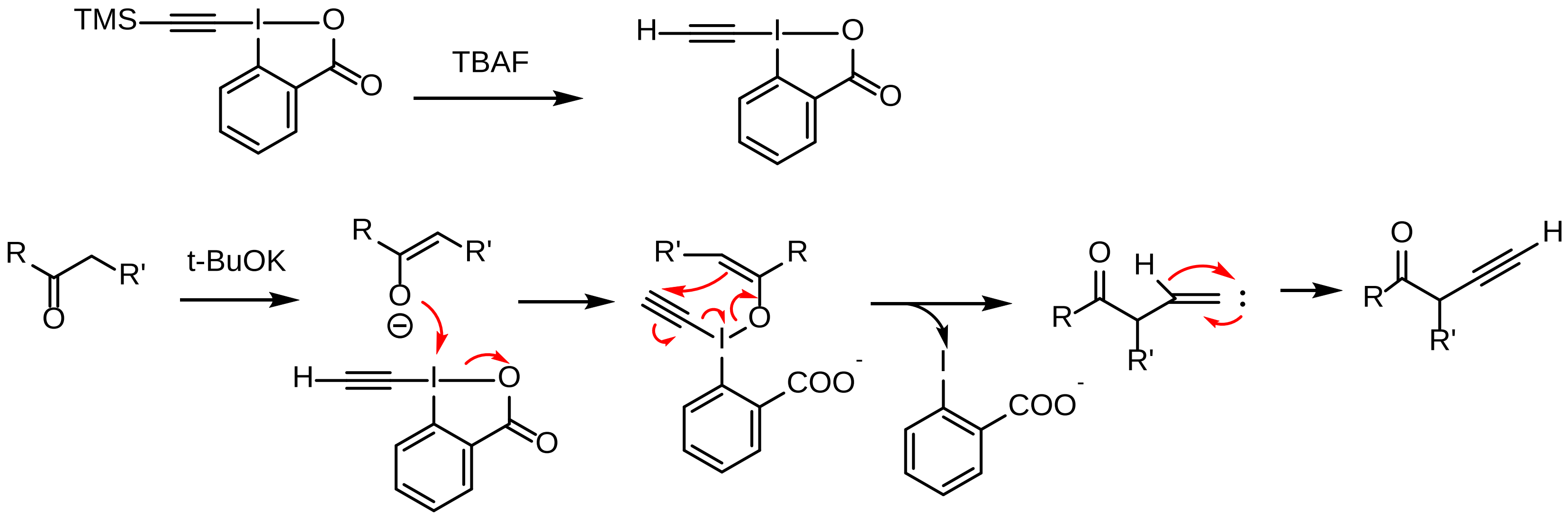
The Summaries of Group Seminars

Reaction 1:

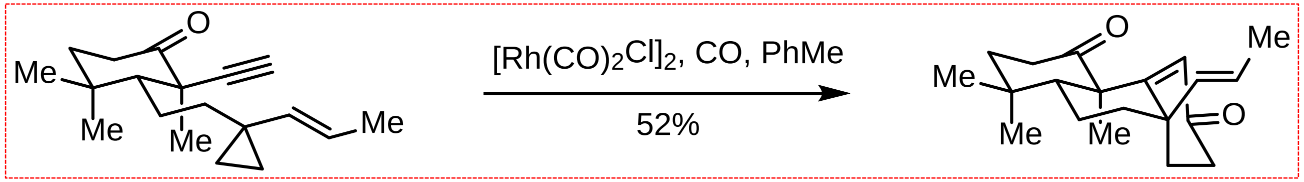


Mechanism:

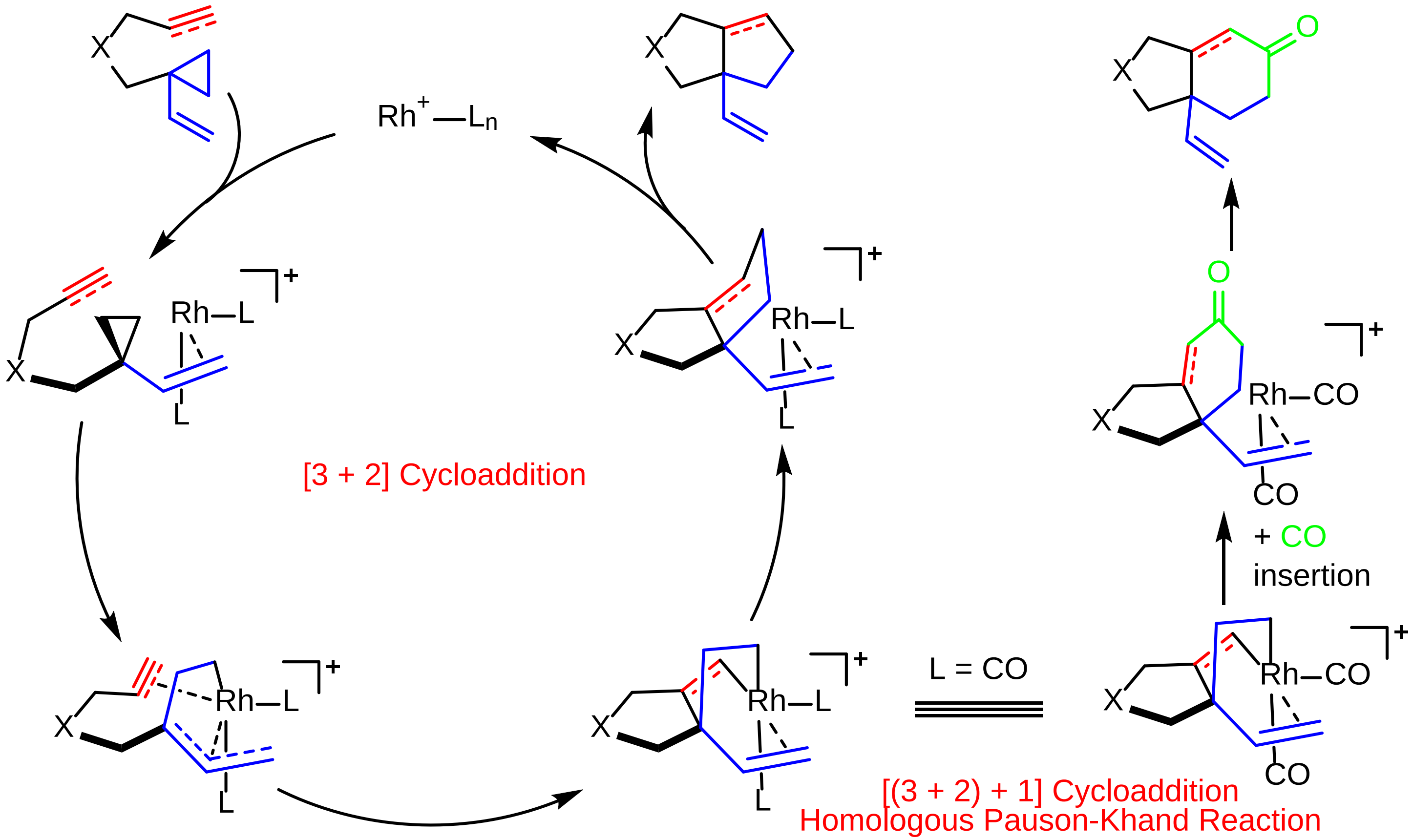


Reference: X.-G. Lei*, et al. *J. Am. Chem. Soc.* **2020**, *142*, 2238-2243.
Chem. Commun. **2014**, *50*, 3810−3813.

Reaction 2:

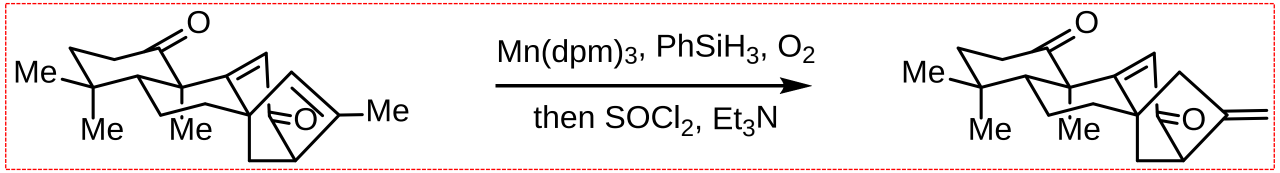


Mechanism:

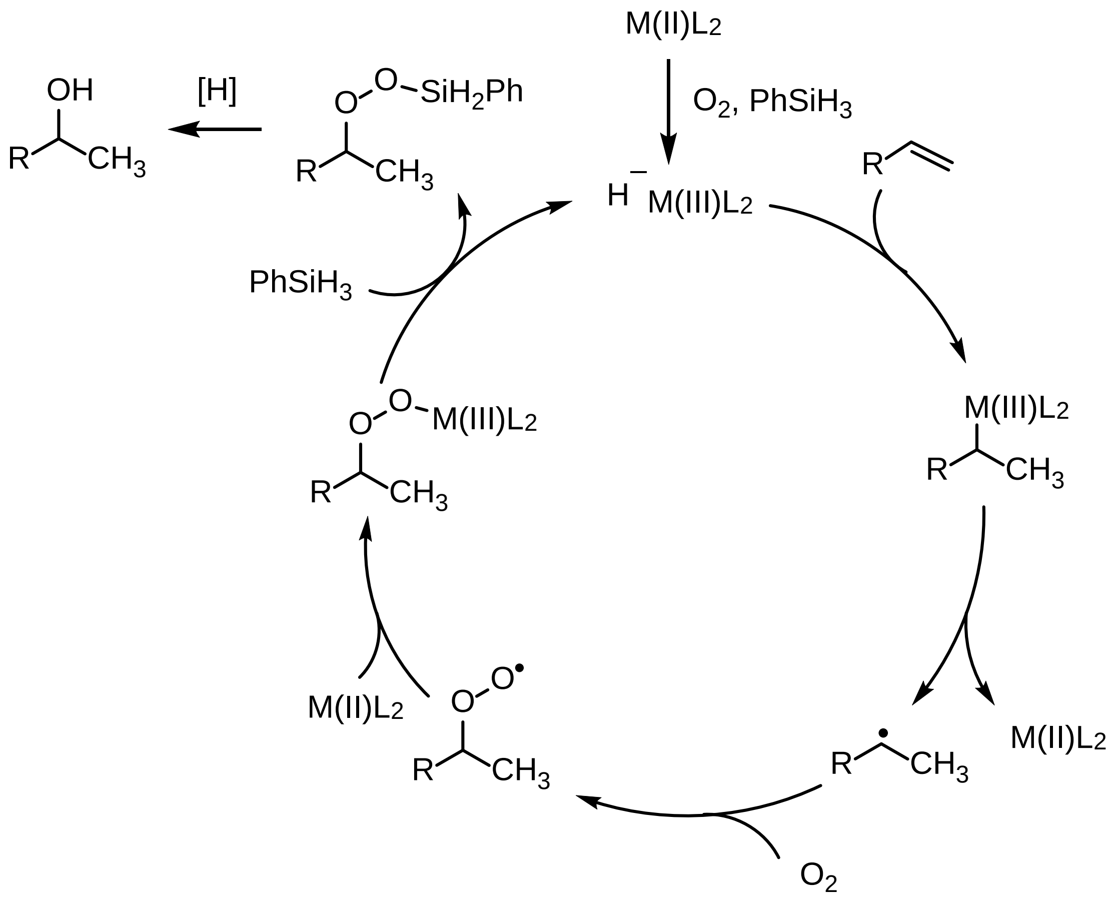


Reference: X.-G. Lei*, et al. *J. Am. Chem. Soc.* **2020**, *142*, 2238-2243.
Org. Lett. **2010**, *12*, 2528−2531.

Reaction 3:

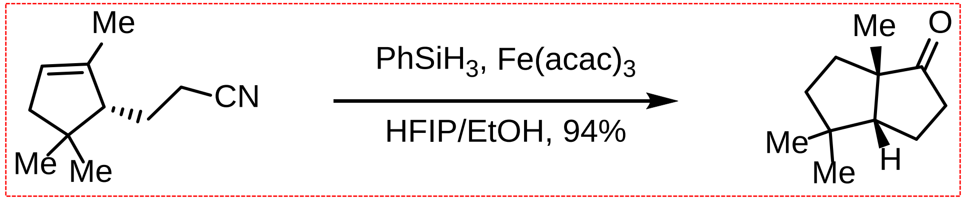


Mechanism: Mukaiyama hydration

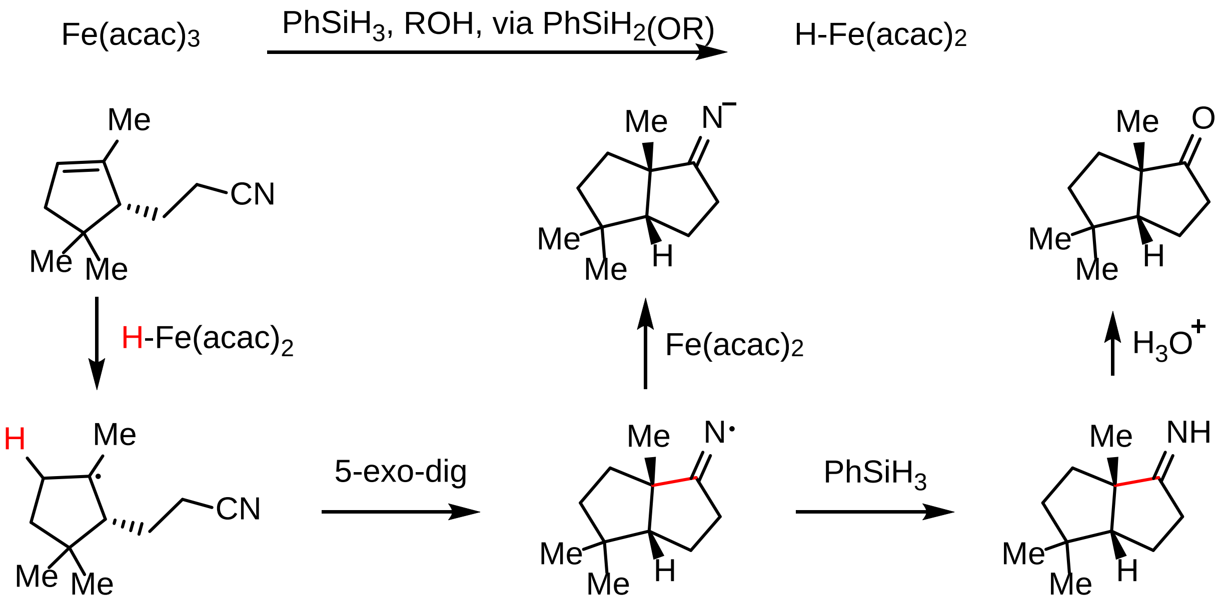


Reference: X.-G. Lei*, et al. *J. Am. Chem. Soc.* **2020**, *142*, 2238-2243.
Chem. Lett. **1990**, *19*, 1869−1872.

Reaction 4:

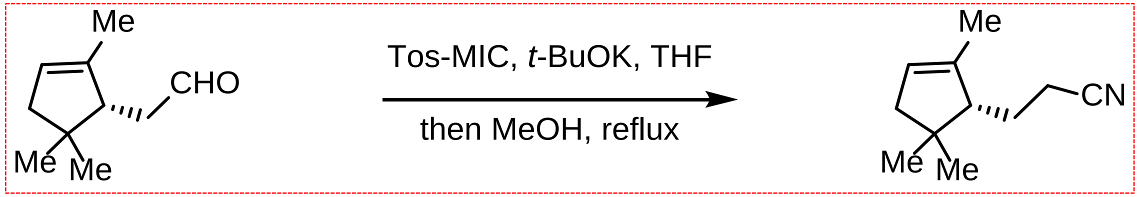


Mechanism: HAT-mediated alkene-nitrile cyclization

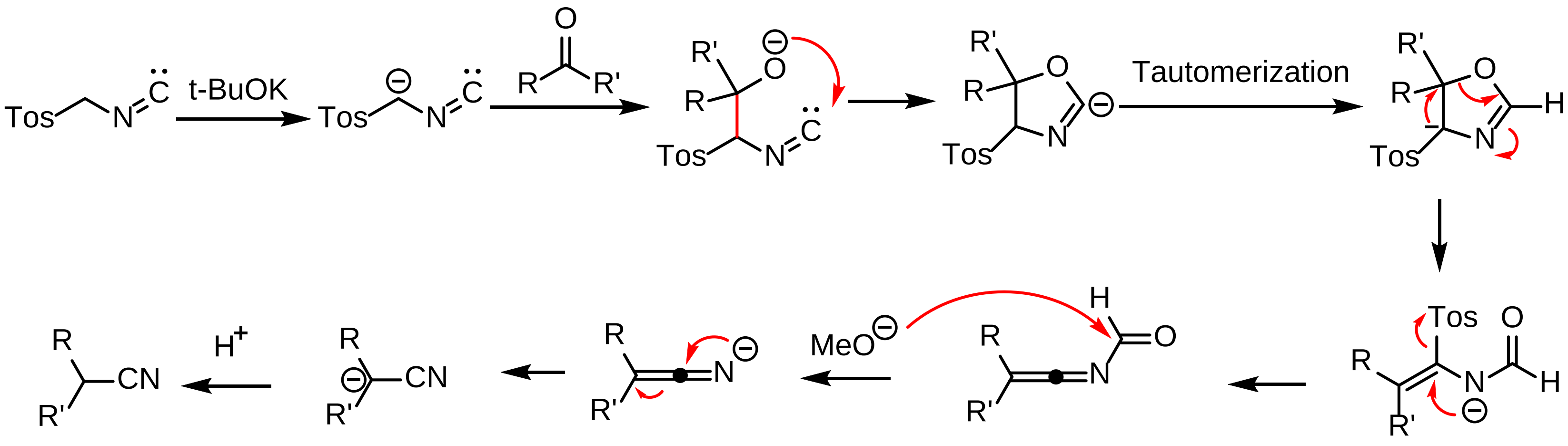


Reference: H. -B. Zhai, et al. *Angew. Chem. Int. Ed.* **2020**, *59*, 16475 – 16479.
Chem. Eur. J. **2018**, *24*, 18658 – 18662.

Reaction 5:

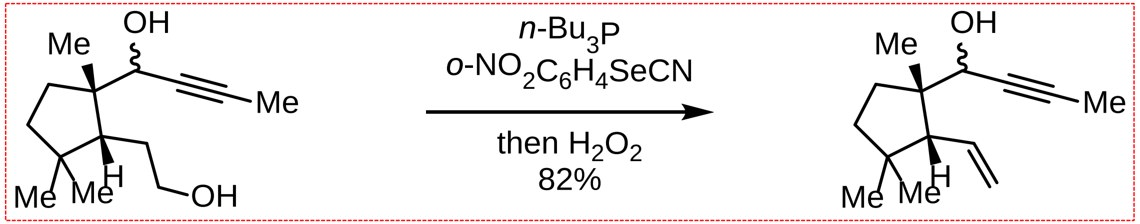


Mechanism: van Leusen reaction

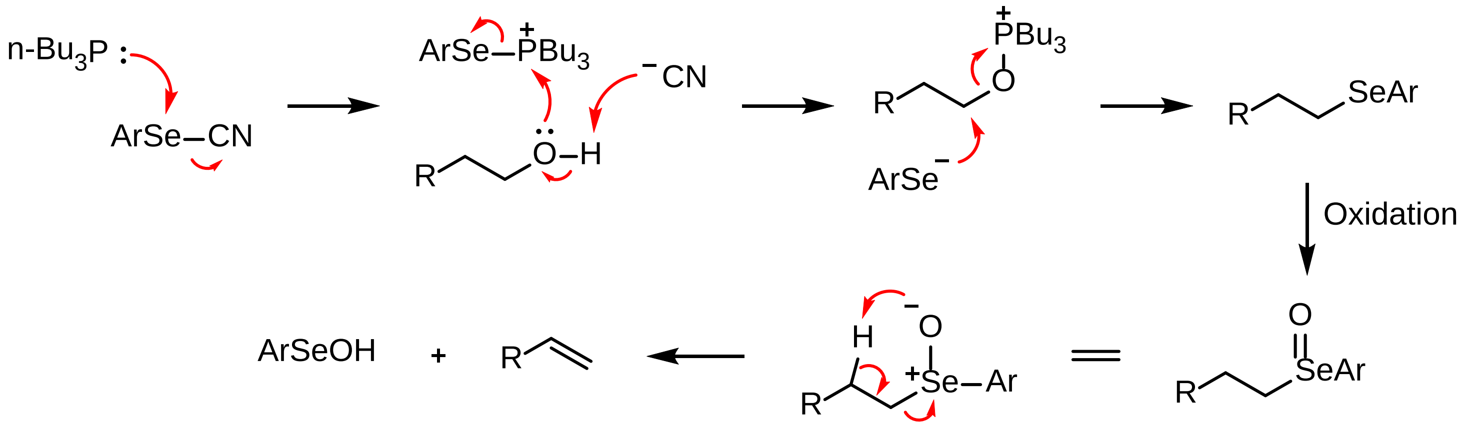


Reference: H. -B. Zhai, et al. *Angew. Chem. Int. Ed.* **2020**, *59*, 16475–16479.
Tetrahedron Lett. **1973**, *14,* 1357 – 1360.

Reaction 6:

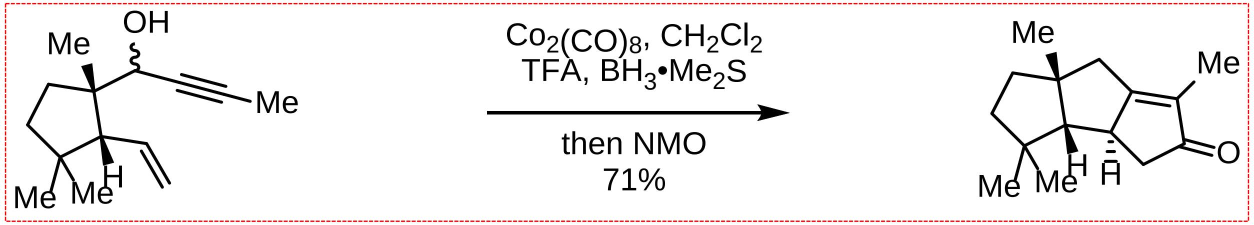


Mechanism: Grieco elimination reaction

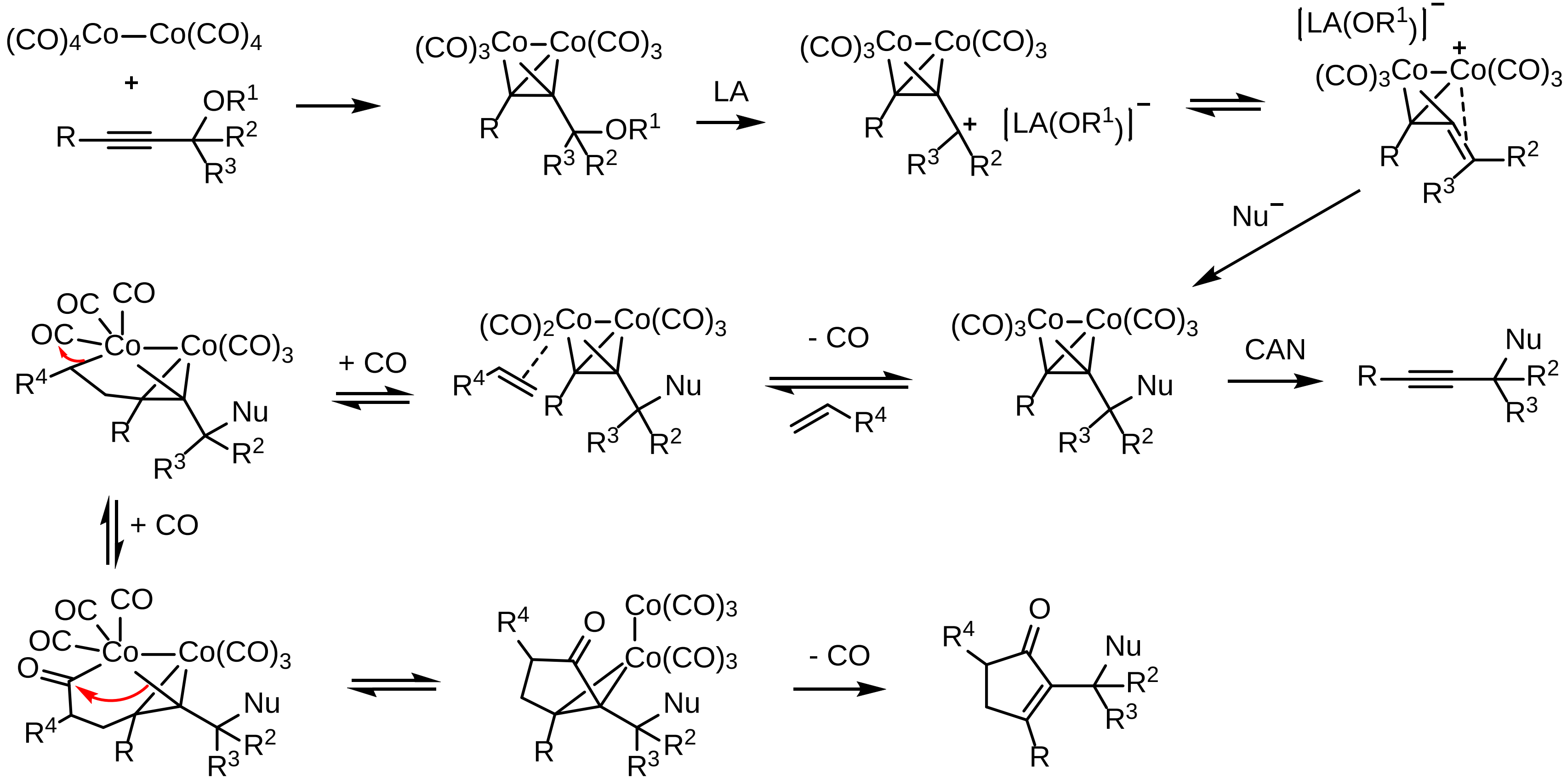


Reference: H. -B. Zhai, et al. *Angew. Chem. Int. Ed.* **2020**, *59*, 16475–16479.
J. Org. Chem. **1976**, *41*, 1485 – 1486.

Reaction 7:

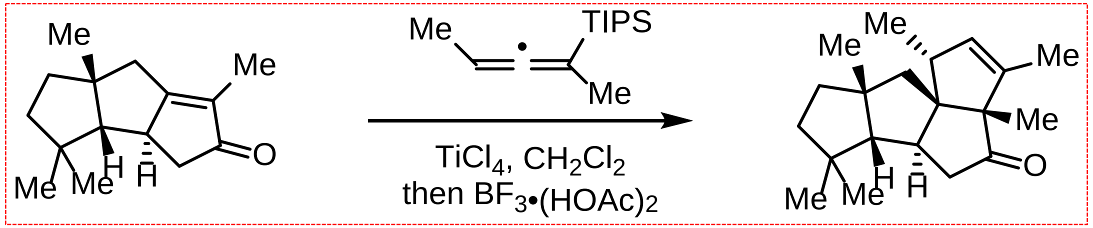


Mechanism: Nicholas reaction / Pauson-Khand reaction



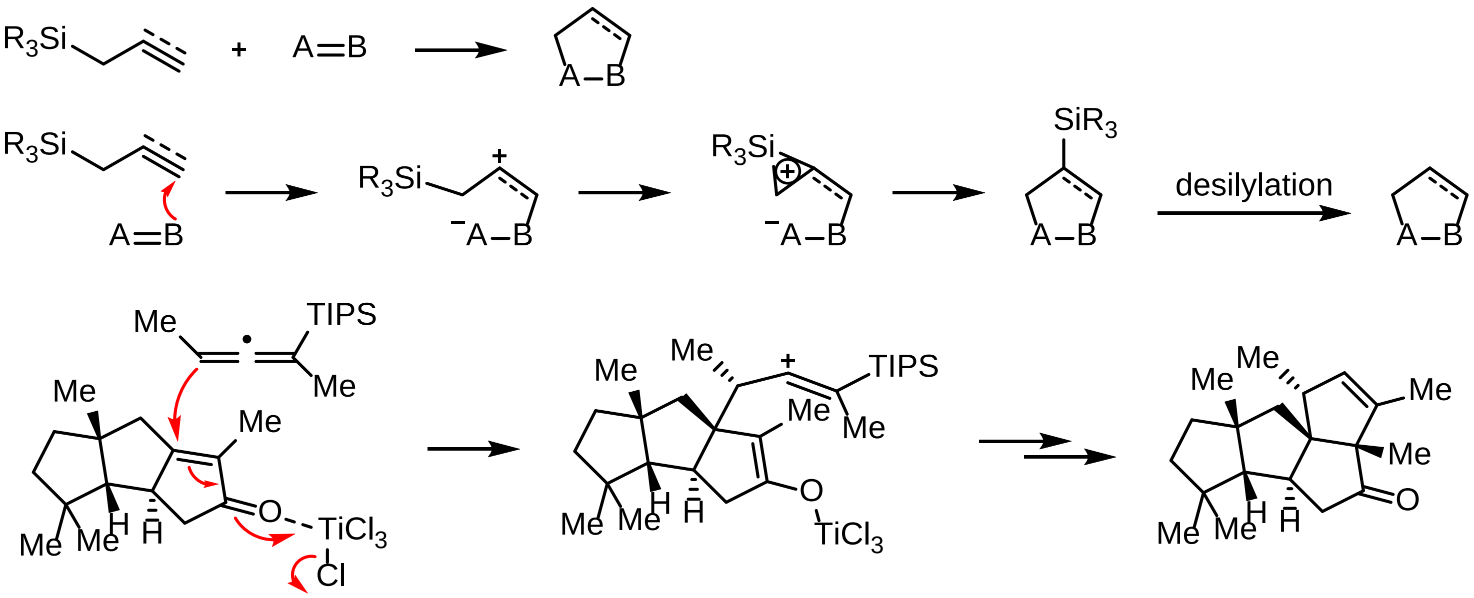
Reference: H. -B. Zhai, et al. *Angew. Chem. Int. Ed.* **2020**, *59*, 16475–16479.
J. Am. Chem. Soc. **1985**, *107,* 4999 – 5001; *Tetrahedron Lett.* **1990**, *31*, 5289 – 5292.

Reaction 8:



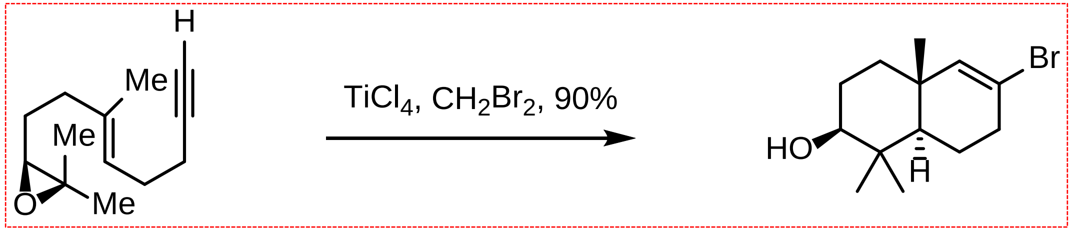
Mechanism: Danheiser Annulation

General reaction scheme

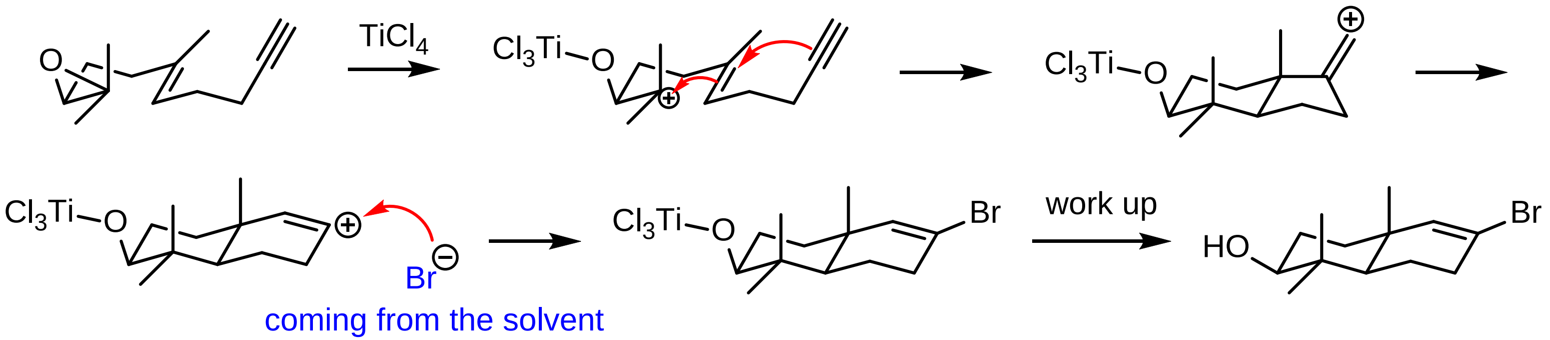


Reference: H. -B. Zhai, et al. *Angew. Chem. Int. Ed.* **2020**, *59*, 16475–16479.

Reaction 9:

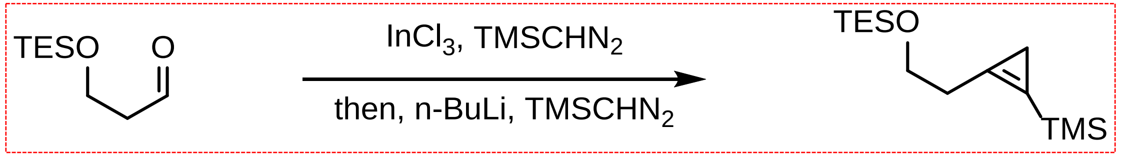


Mechanism:

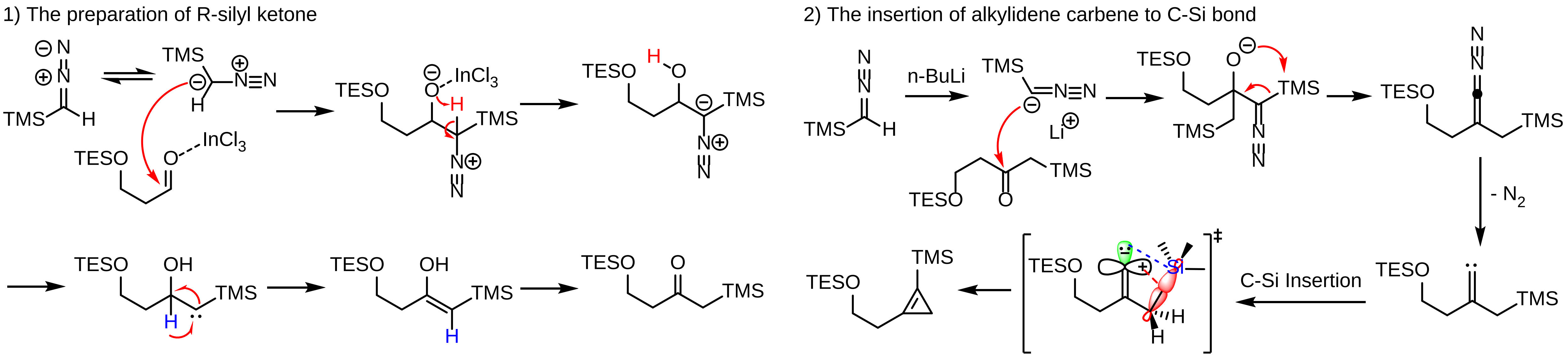


Reference: Z. Yang, et al. *J. Am. Chem. Soc.* **2020**, *142*, 8116–8121.
J. Am. Chem. Soc. **1972**, *94,* 8604-8605.
Org. Lett. **2016**, *18,* 4626-4629.
Chem. Commun. **2018**, *54,* 11025.

Reaction 10:

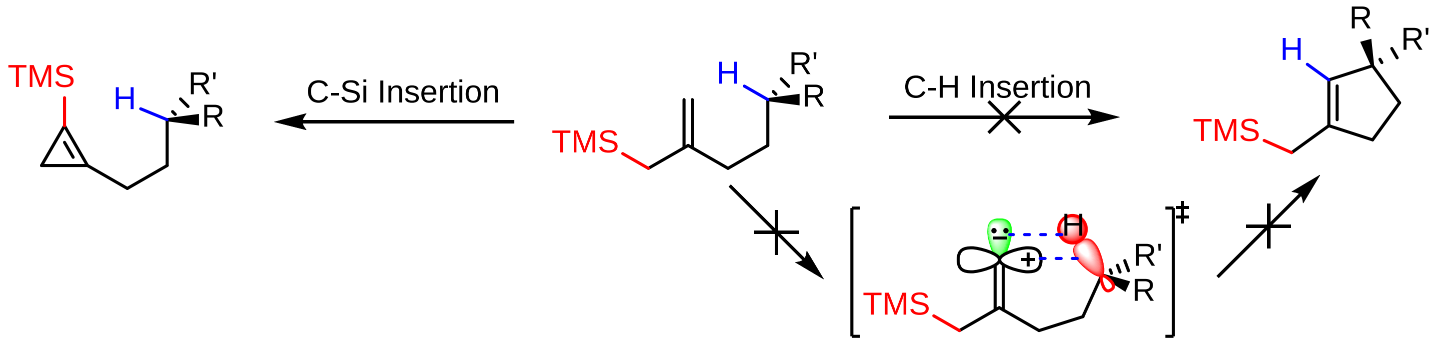


Mechanism:



Reference: Z. Yang, et al. *J. Am. Chem. Soc.* **2020**, *142*, 8116–8121.
1) *J. Org. Chem.* **1989**, *54,* 3254; *Synthesis* **1988**, 228.
2) *J. Am. Chem. Soc.* **2010**, *132*, 6640.

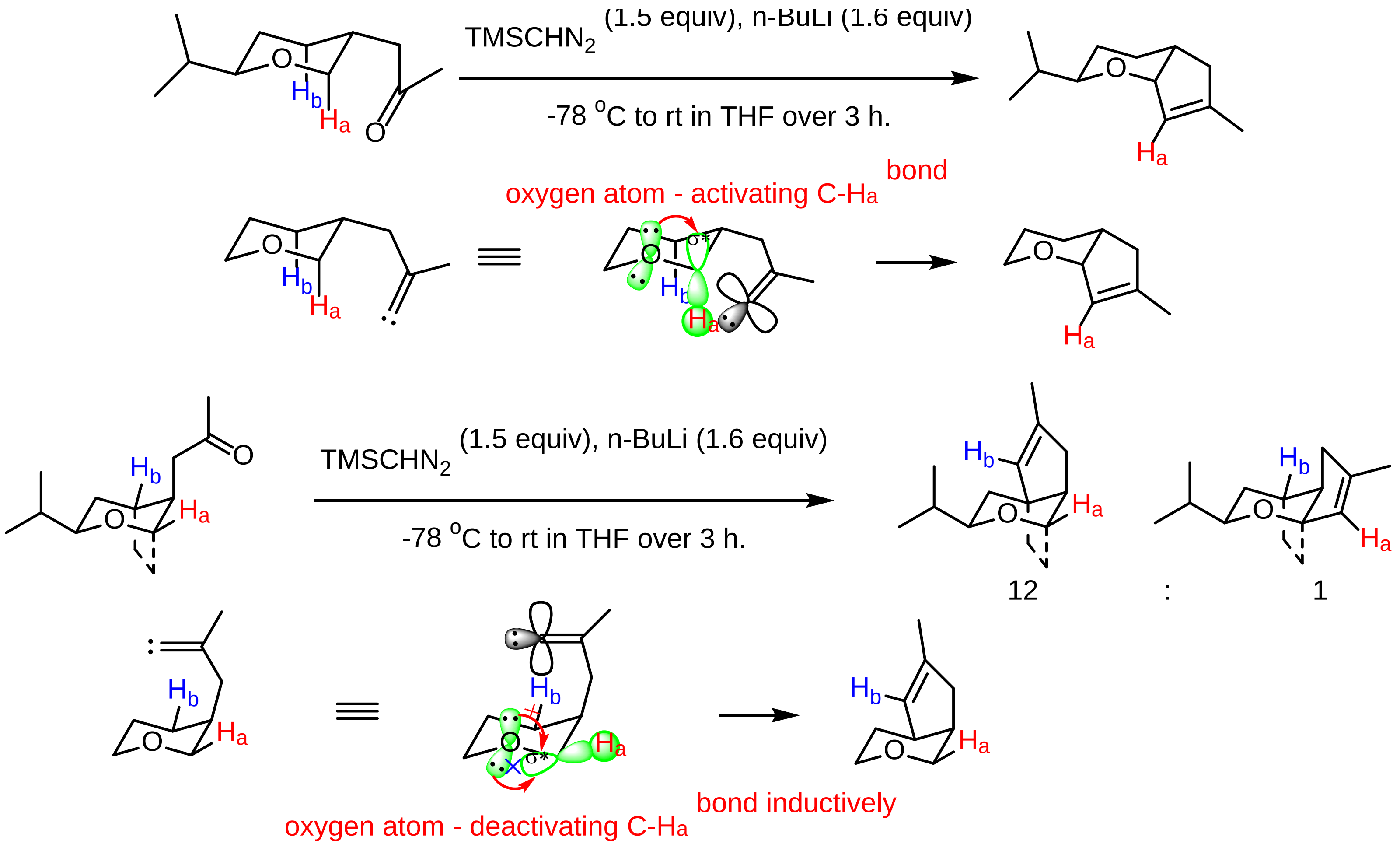
Reaction 10: additional 1



This is probably due to a more favorable interaction of the empty p orbital of the carbenic carbon with the nearby C-Si bond than with the rather remote Cγ-H bond.

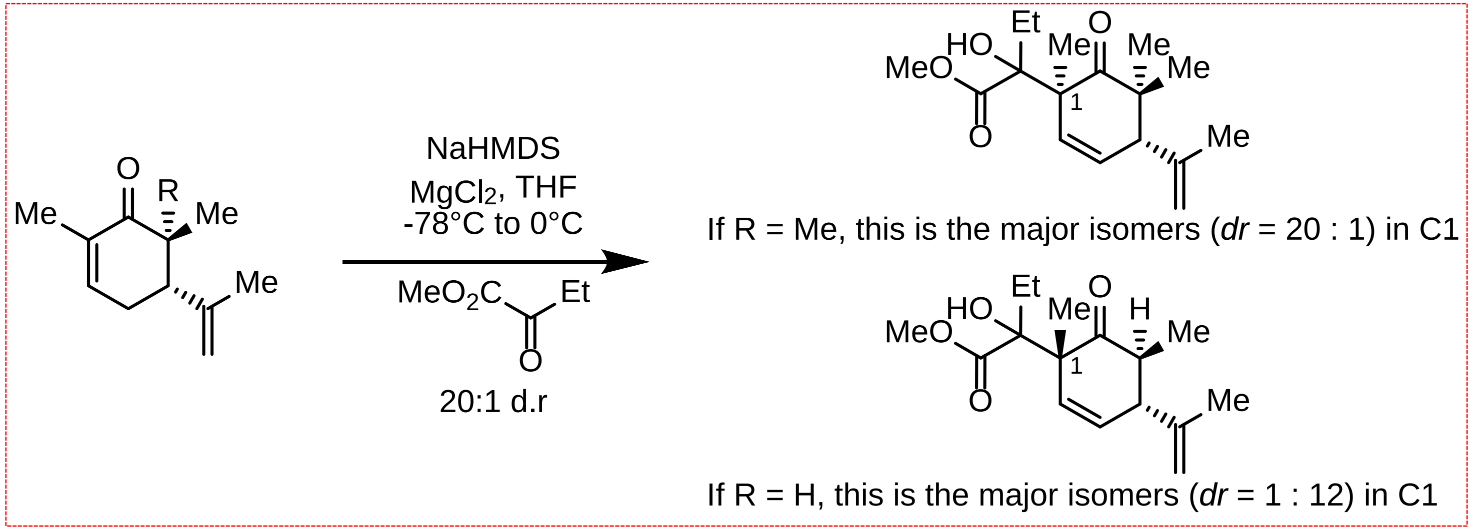
Reference: Z. Yang, et al. *J. Am. Chem. Soc.* **2020**, *142*, 8116–8121.
J. Am. Chem. Soc. **2010**, *132*, 6640.

Reaction 10: additional 2



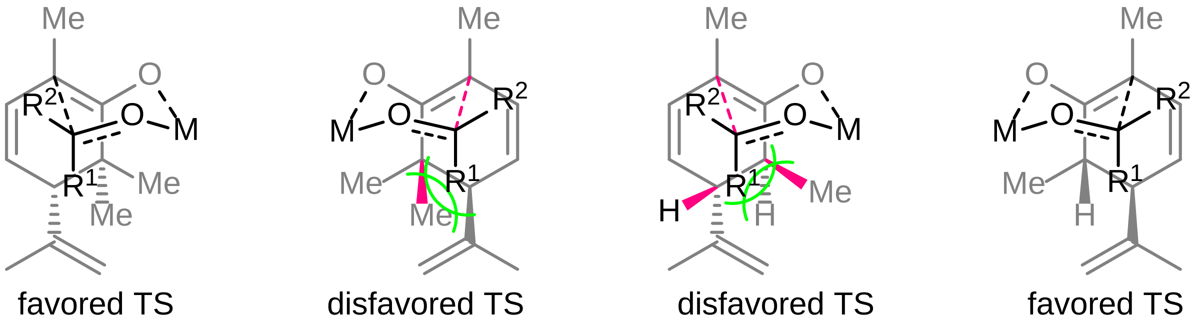
Reference: Z. Yang, et al. *J. Am. Chem. Soc.* **2020**, *142*, 8116–8121.
J. Am. Chem. Soc. **2009**, *131*, 8413-8415.

Reaction 11:



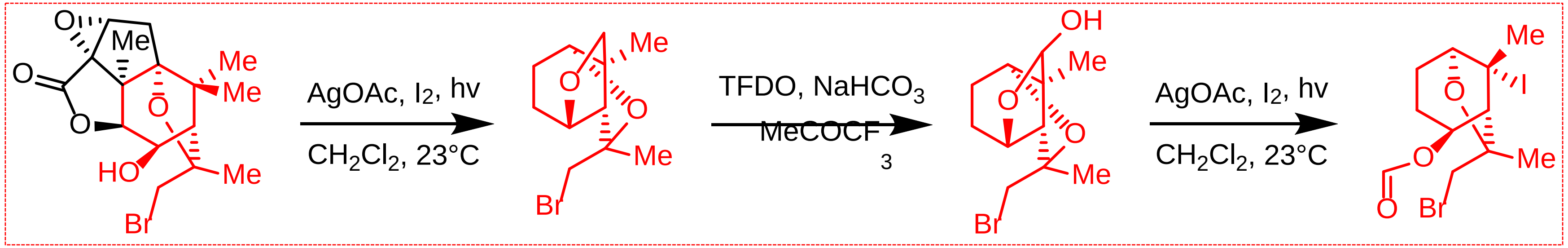
Mechanism:

Possible transition states that explain the diastereoselectivities

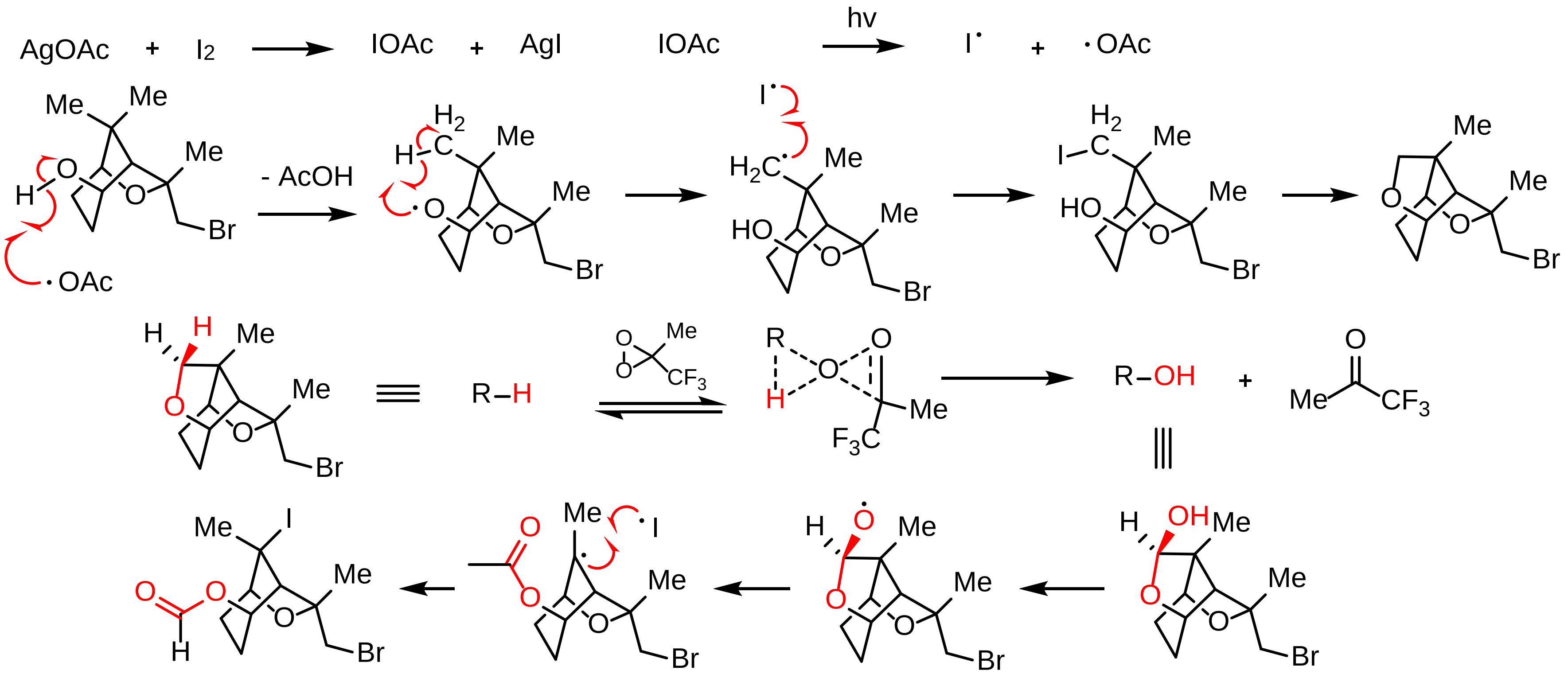


Reference: Ryan A. Shenvi, et al. *J. Am. Chem. Soc.* **2020**, *142,* 11376-11381.

Reaction 12:

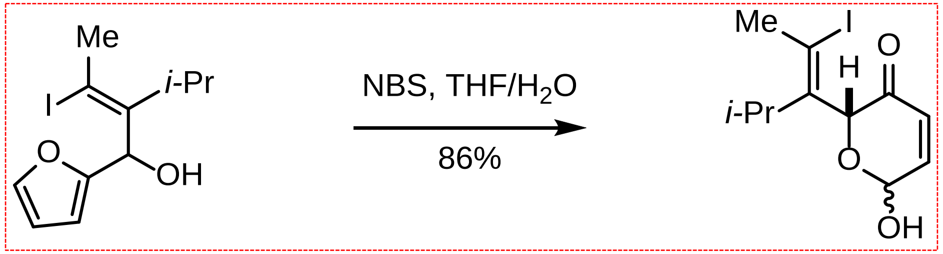


Mechanism:

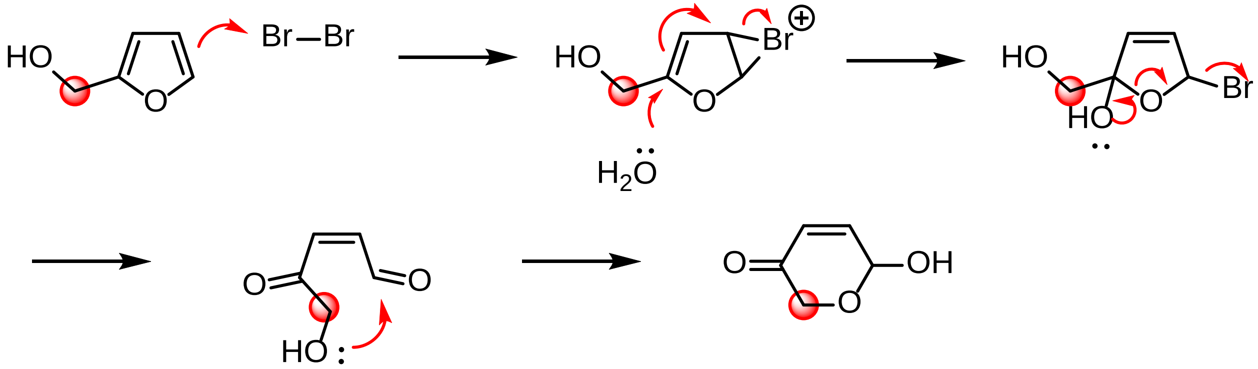


Reference: Ryan A. Shenvi, et al. *J. Am. Chem. Soc.* **2020**, *142*, 11376-11381.
Angew. Chem. Int. Ed. **1964**, *3*, 525 - 538.
Pure & Appl. Chem. **1995**, *67*(5), 811 - 822.

Reaction 13:

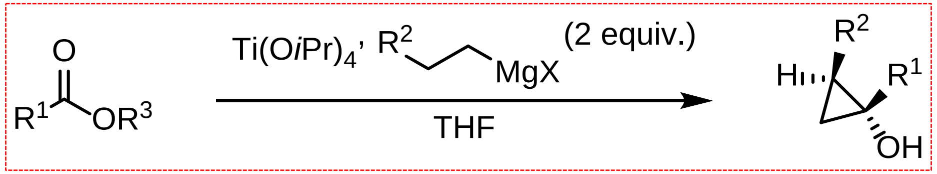


Mechanism: Achmatowicz rearrangement

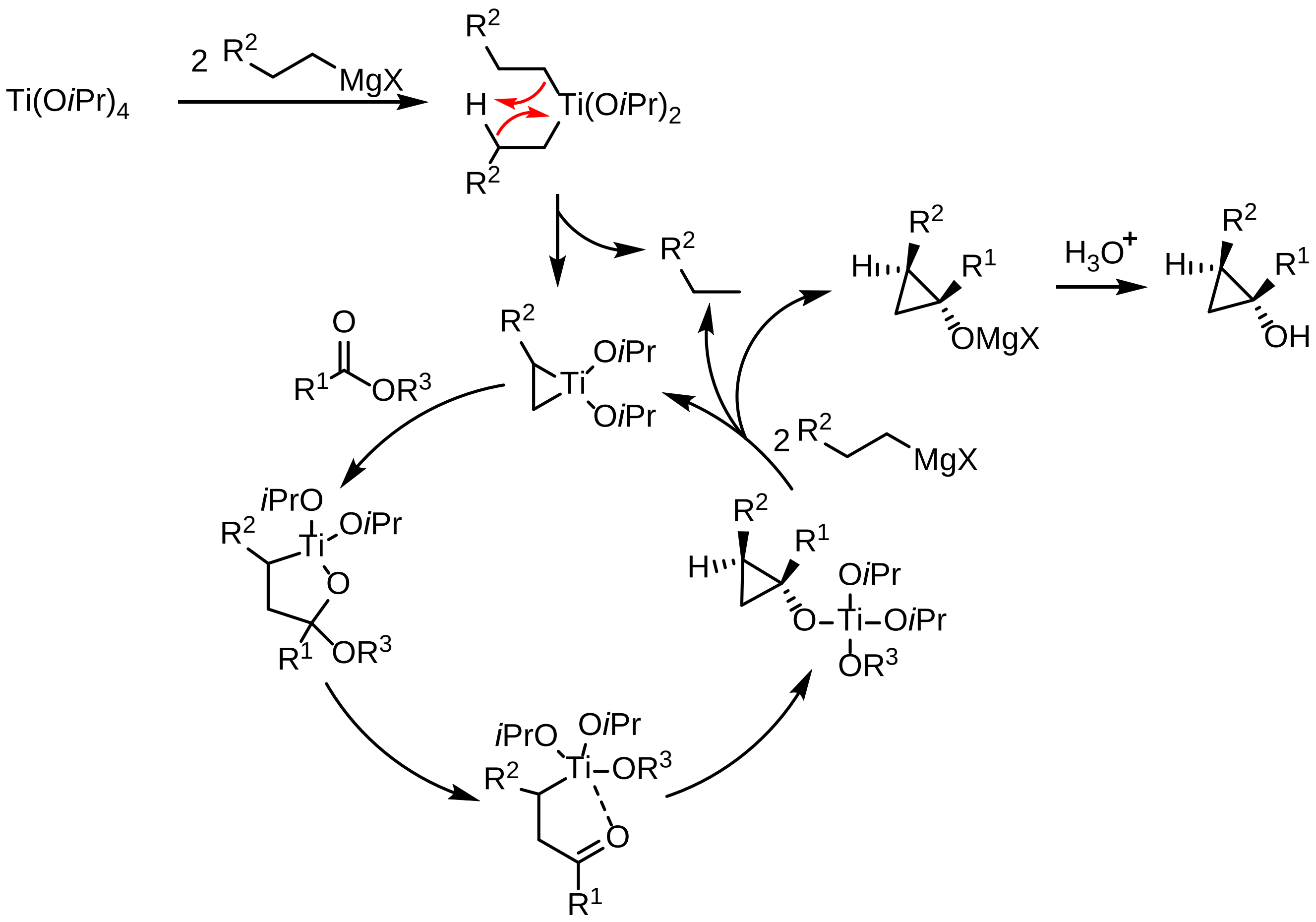


Reference: Glenn C. Micalizio, et al. *J. Am. Chem. Soc.* **2020**, *142*, 12937-12941.
Tetrahedron **1971**, *27*, 1973-1996.

Reaction 14:

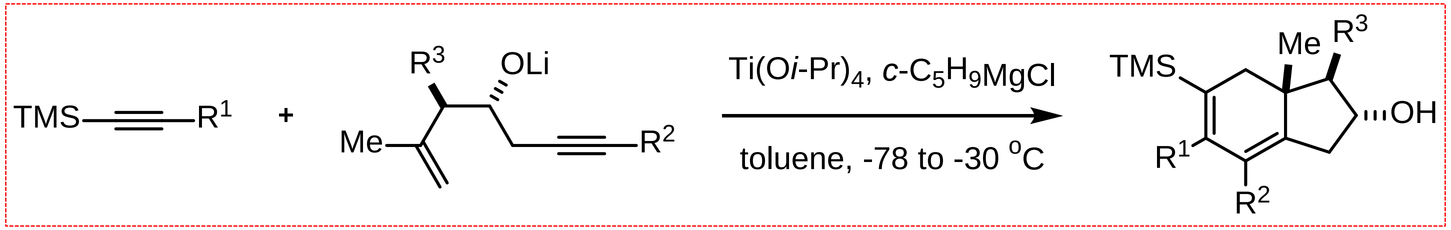


Mechanism: Kulinkovich Reaction

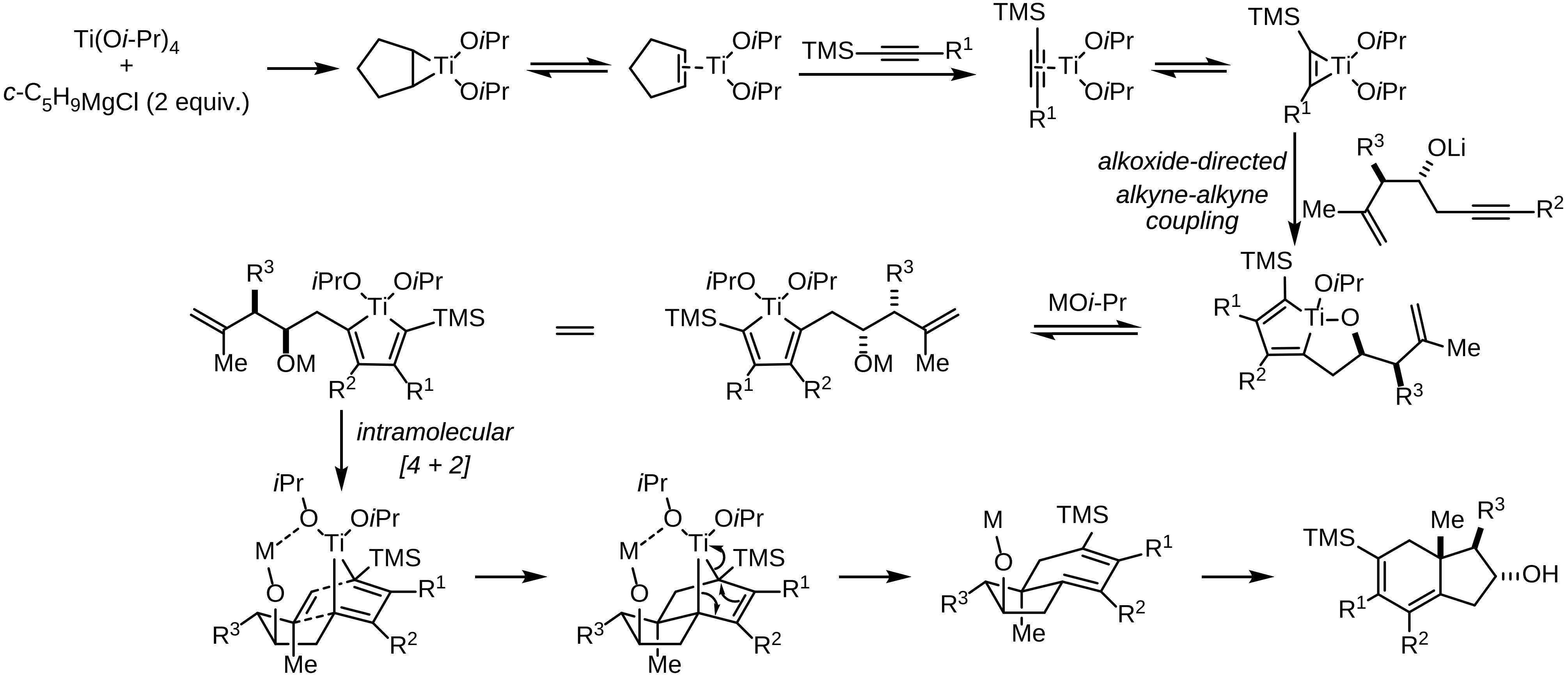


Reference: Glenn C. Micalizio, et al. *J. Am. Chem. Soc.* **2020**, *142*, 12937-12941.

Reaction 15:

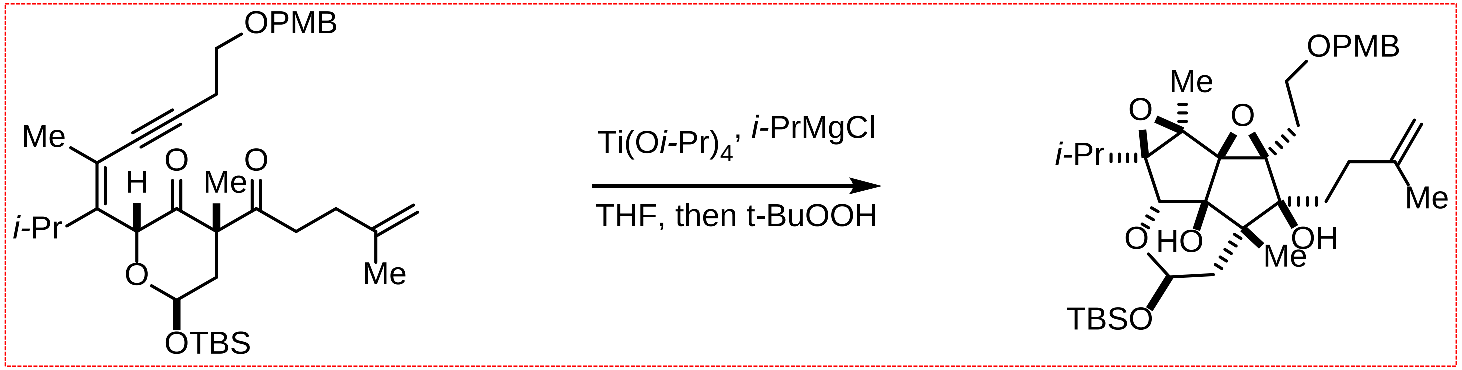


Mechanism:

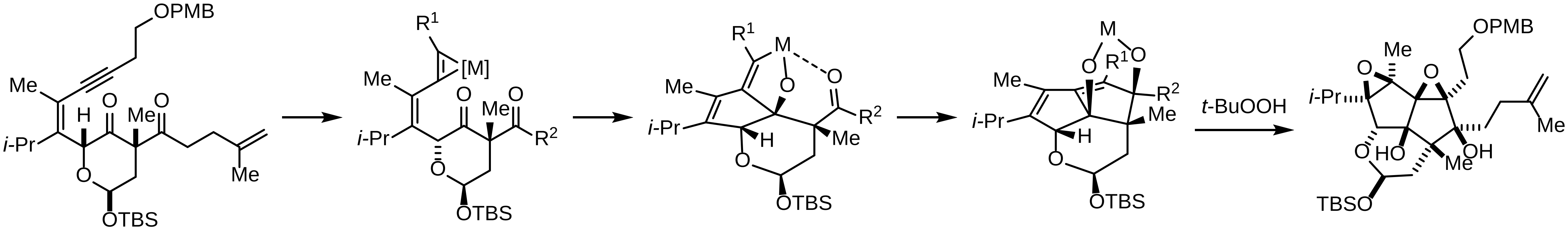


Reference: Glenn C. Micalizio, et al. *J. Am. Chem. Soc.* **2020**, *142*, 12937-12941.
J. Am. Chem. Soc. **2012**, *134*, 2766-2774.

Reaction 16:

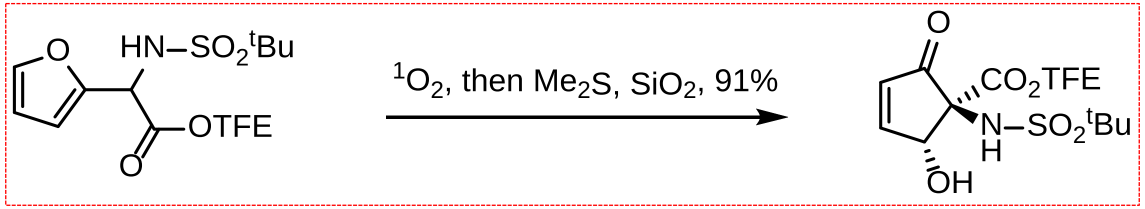


Mechanism:



Reference: Glenn C. Micalizio, et al. *J. Am. Chem. Soc.* **2020**, *142*, 12937-12941.
J. Am. Chem. Soc. **2012**, *134*, 2766-2774.

Reaction 17:



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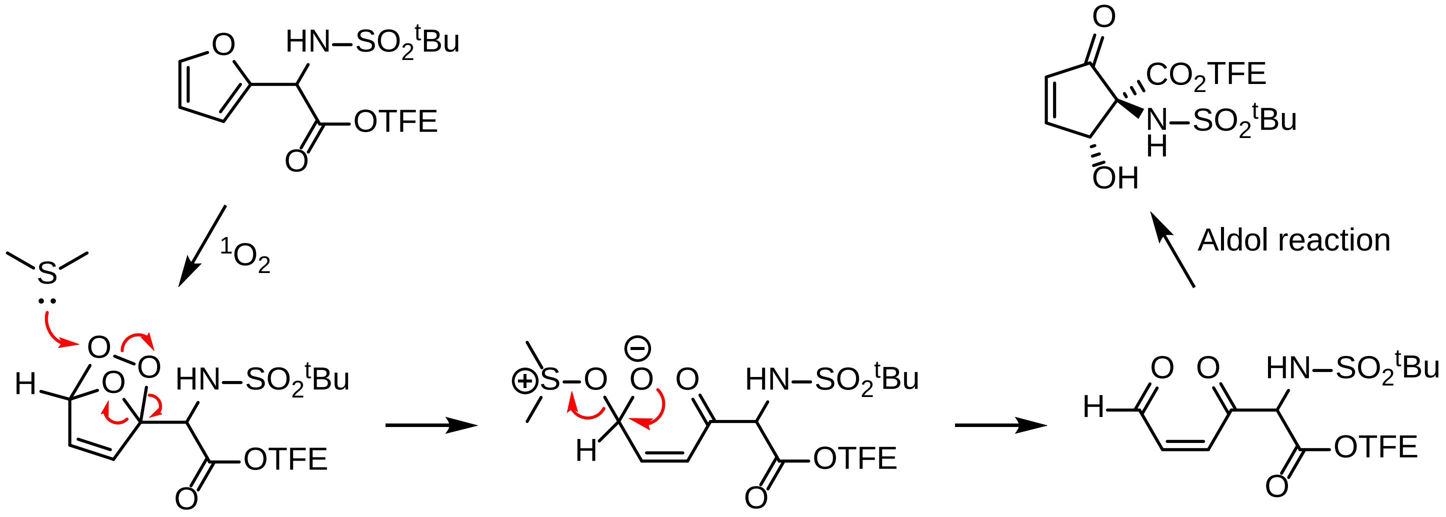
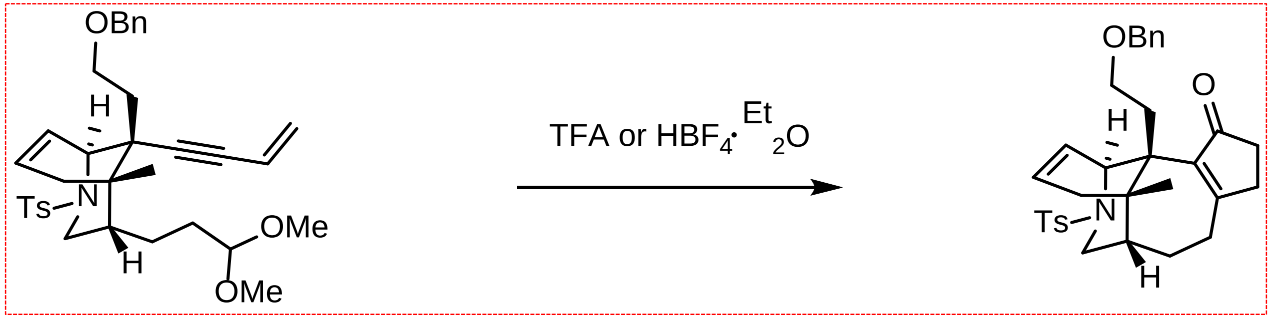


Reference: Phil S. Baran, et al. *J. Am. Chem. Soc.* **2020**, *142*, 13683-13688.

Reaction 18:



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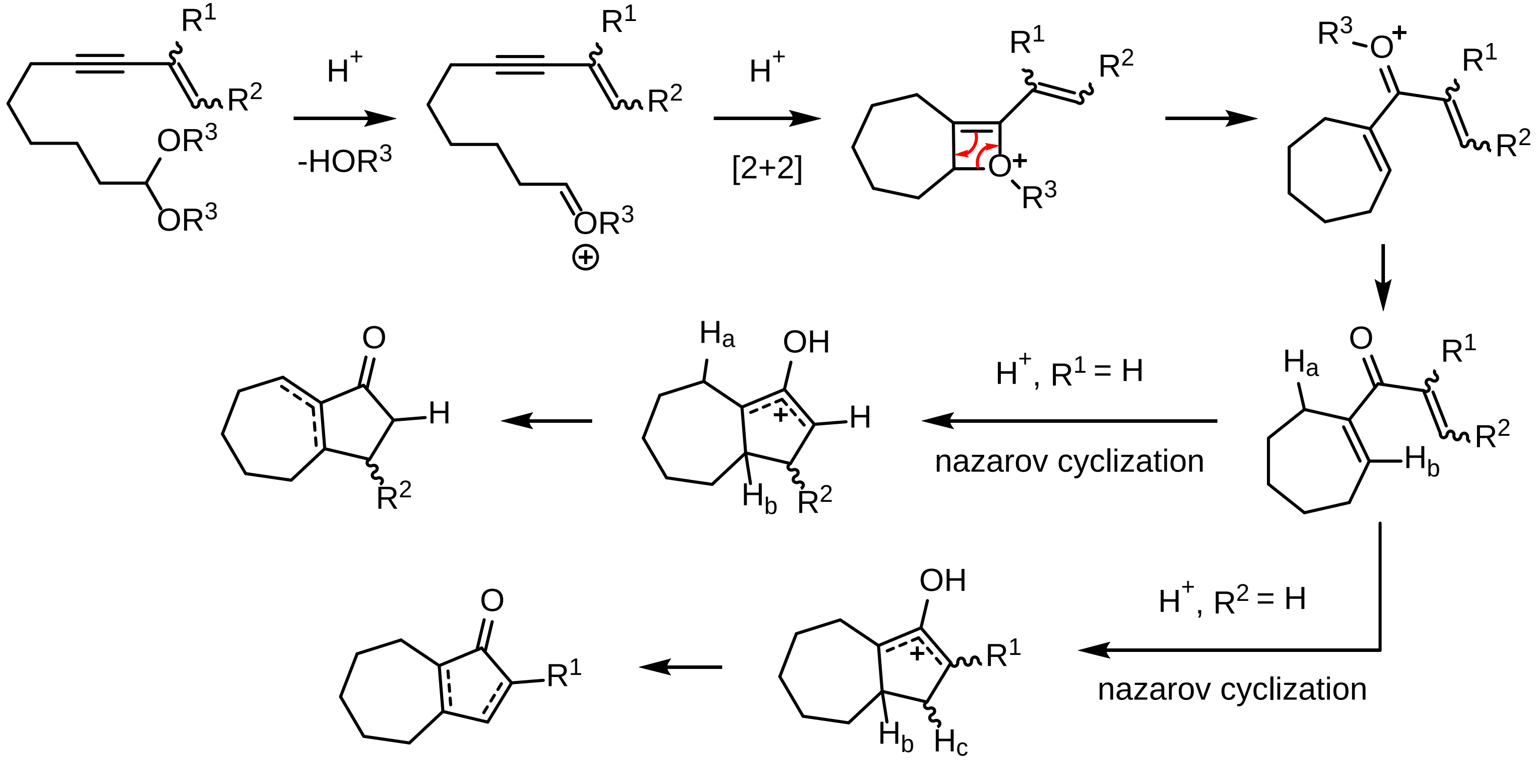
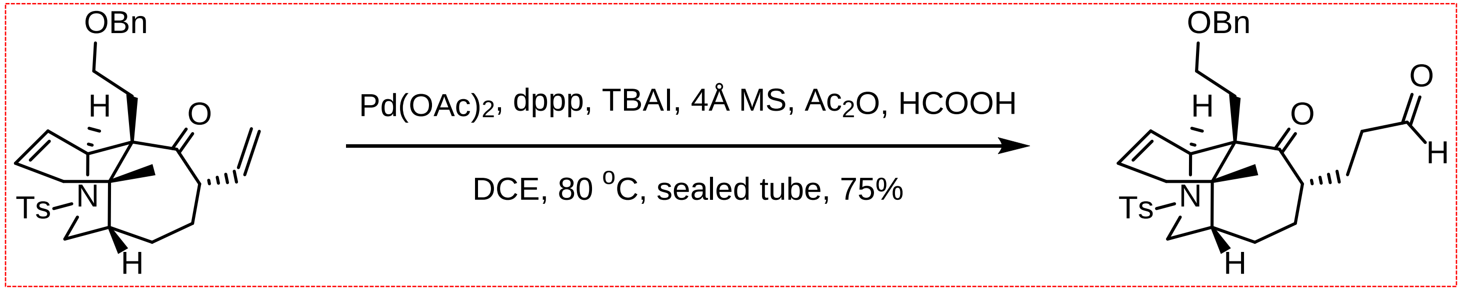


Reference: J. Xu, et al. *Nat. Commun.* **2020**, *11*, 1-6.
Angew. Chem. Int. Ed. **2012**, *51*, 12316-12320.

Reaction 19:



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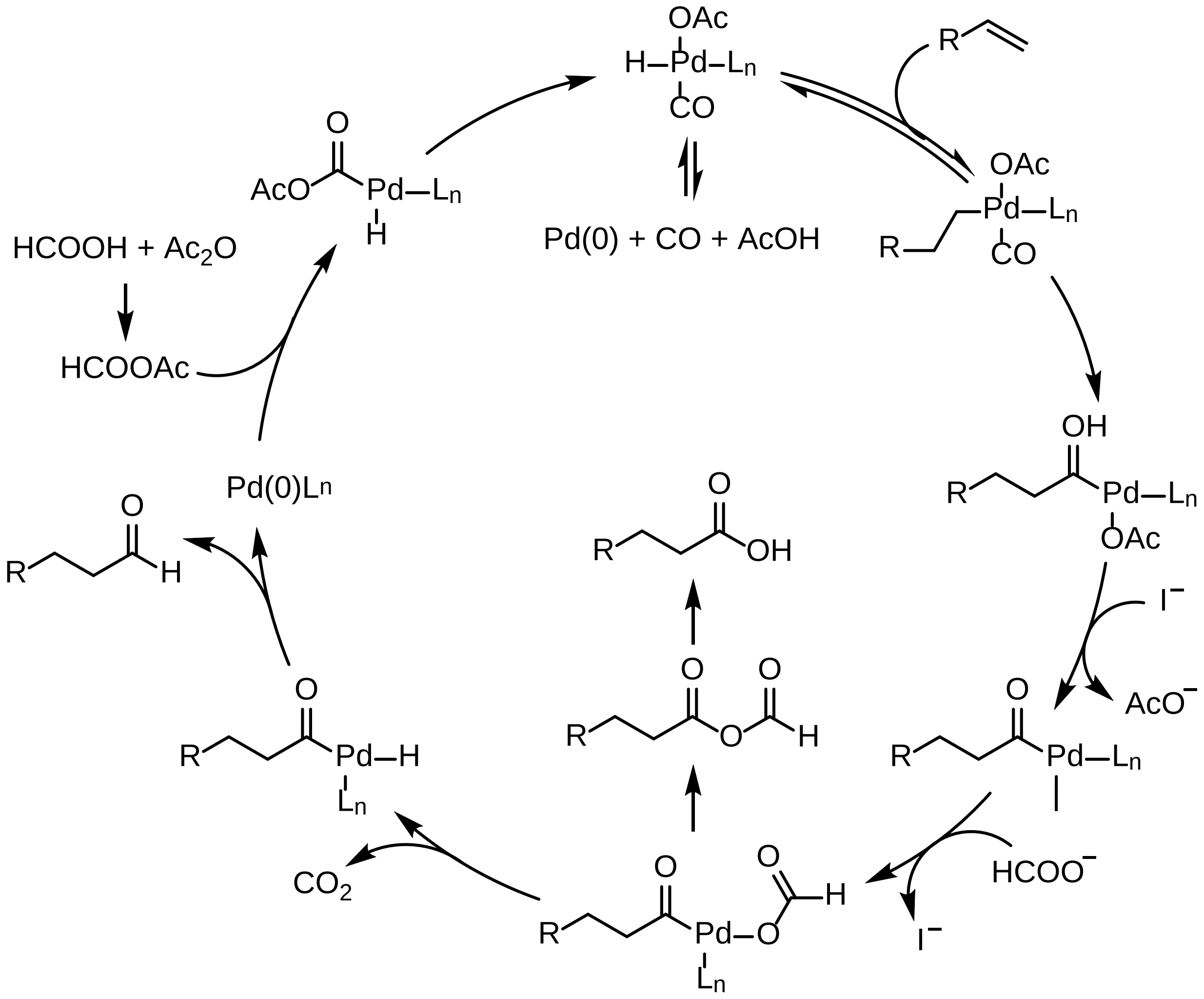
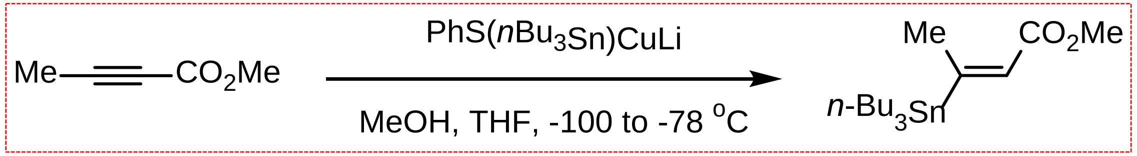


Reference: J. Xu, et al. *Nat. Commun.* **2020**, *11,* 1-6*; J. Am. Chem. Soc.* **2016**, *138,* 14864-14867.

Reaction 20:



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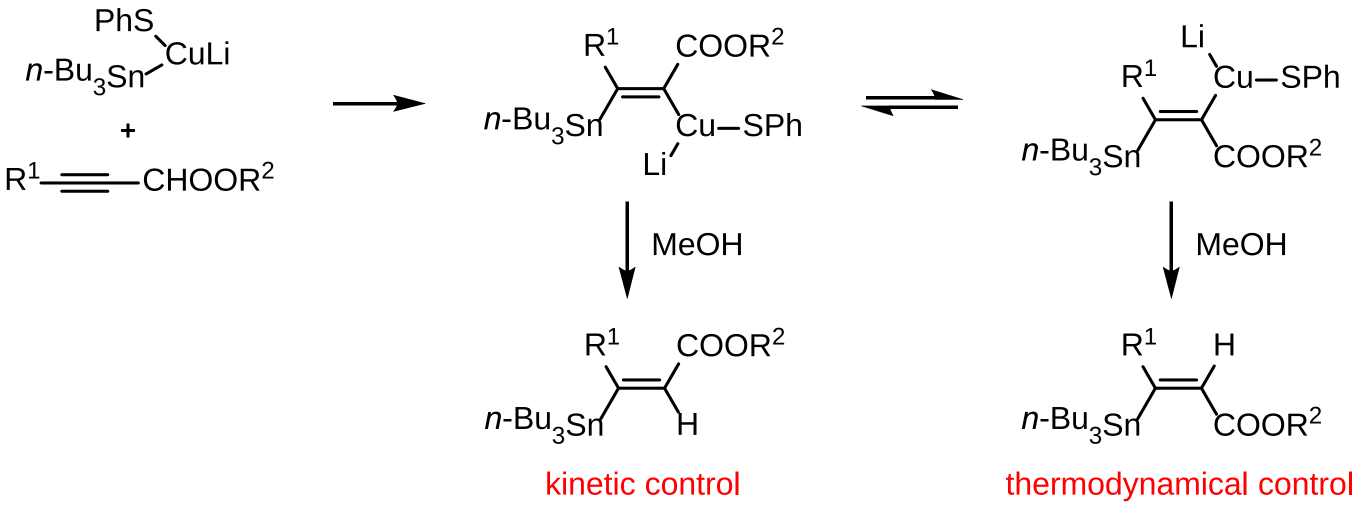
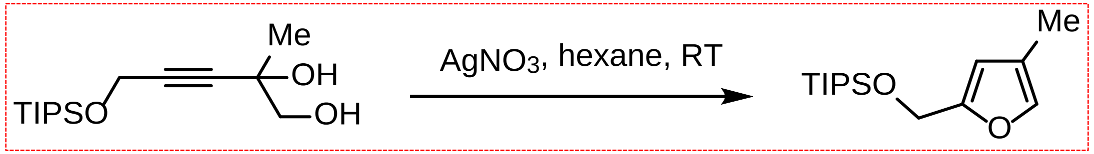


Reference: M. Miyashita*, K. Tanino, et al. *Science*, **2004**, *305*, 495-499.
J. Org. Chem. **1980**, *45,* 4263-4264.

Reaction 21:



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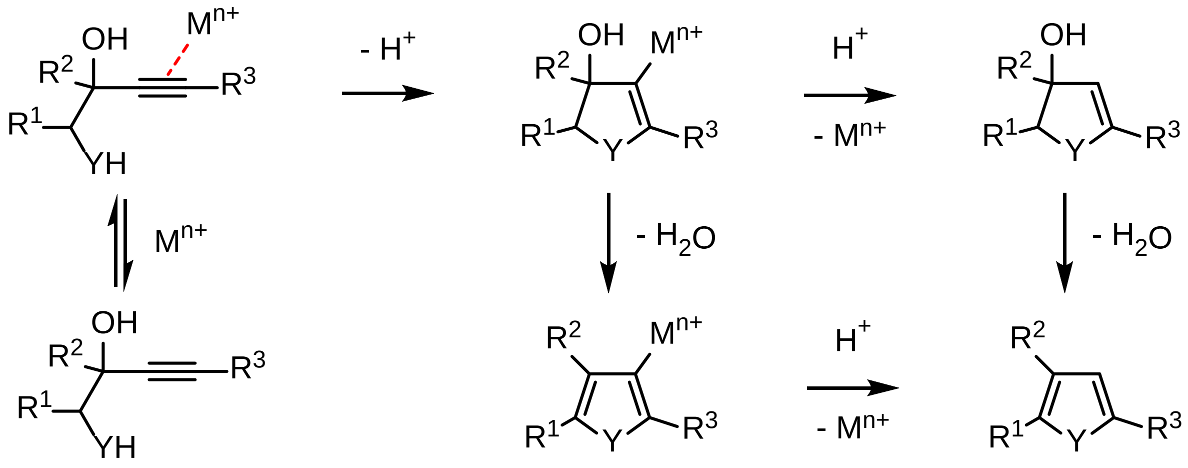
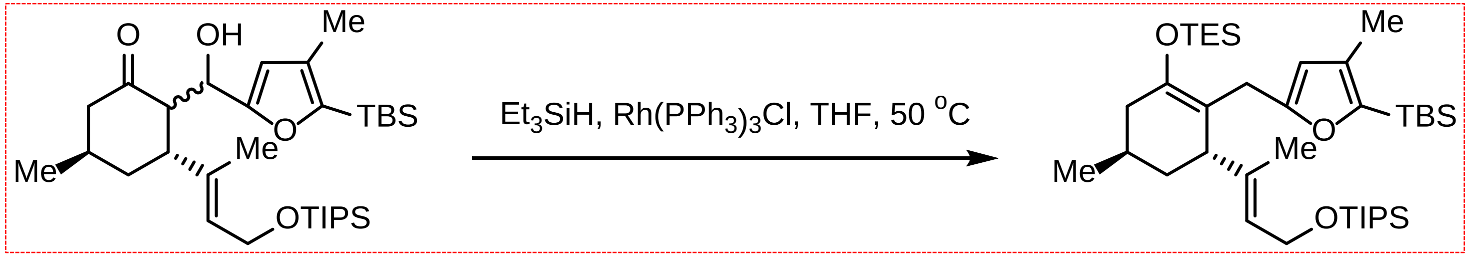


Reference: M. Miyashita*, K. Tanino, et al. *Science*, **2004**, *305*, 495-499.
J. Org. Chem. **2013,** *78*, 4919-4928.

Reaction 22:



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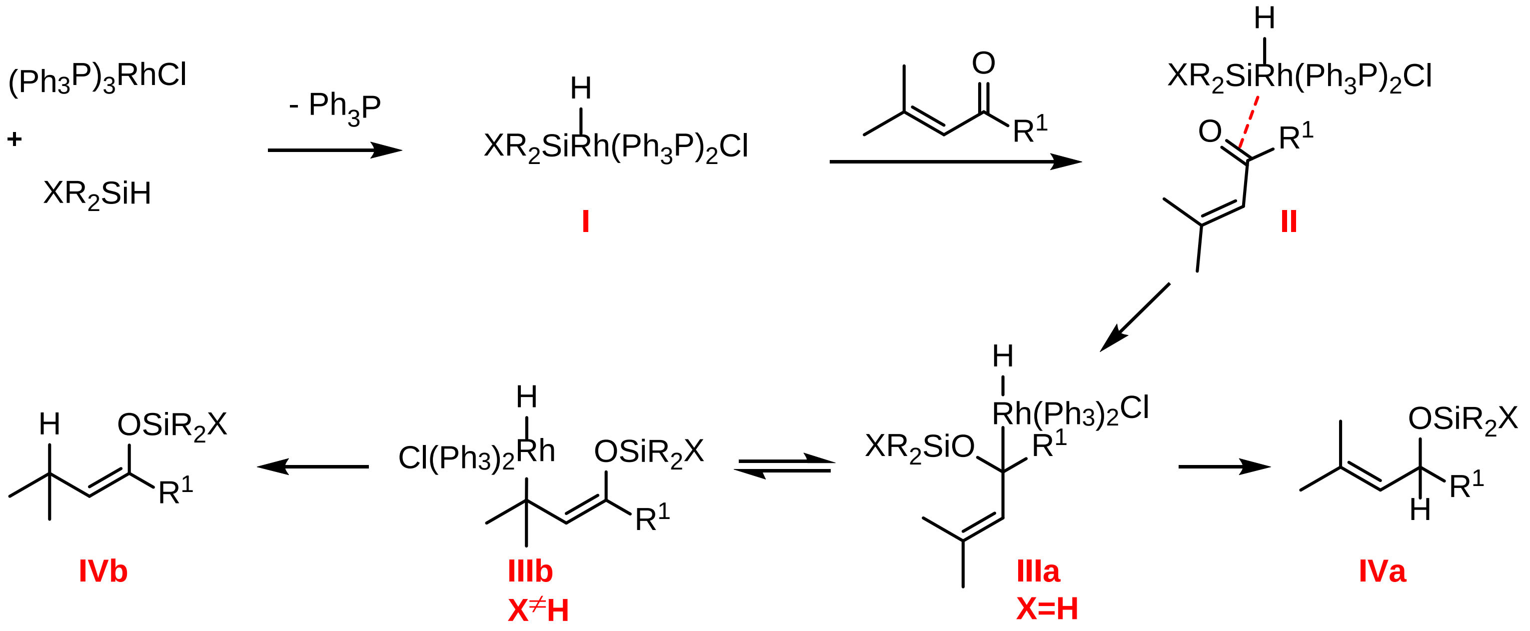
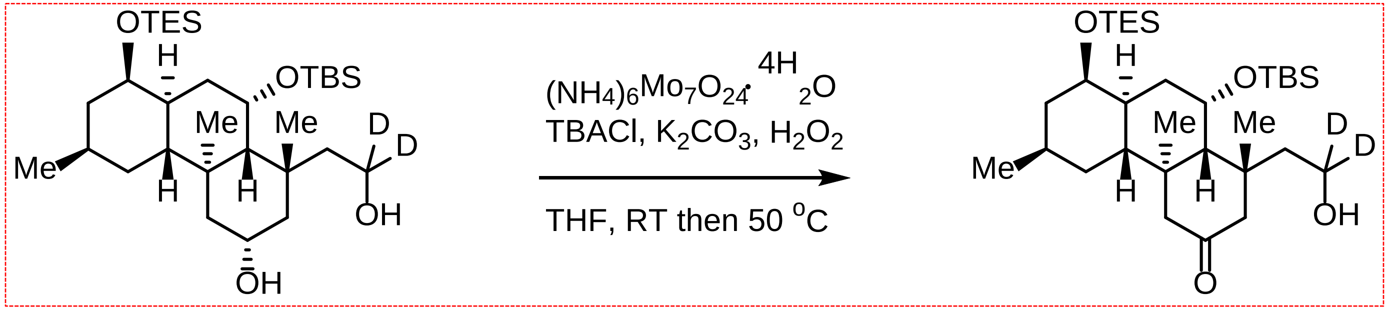


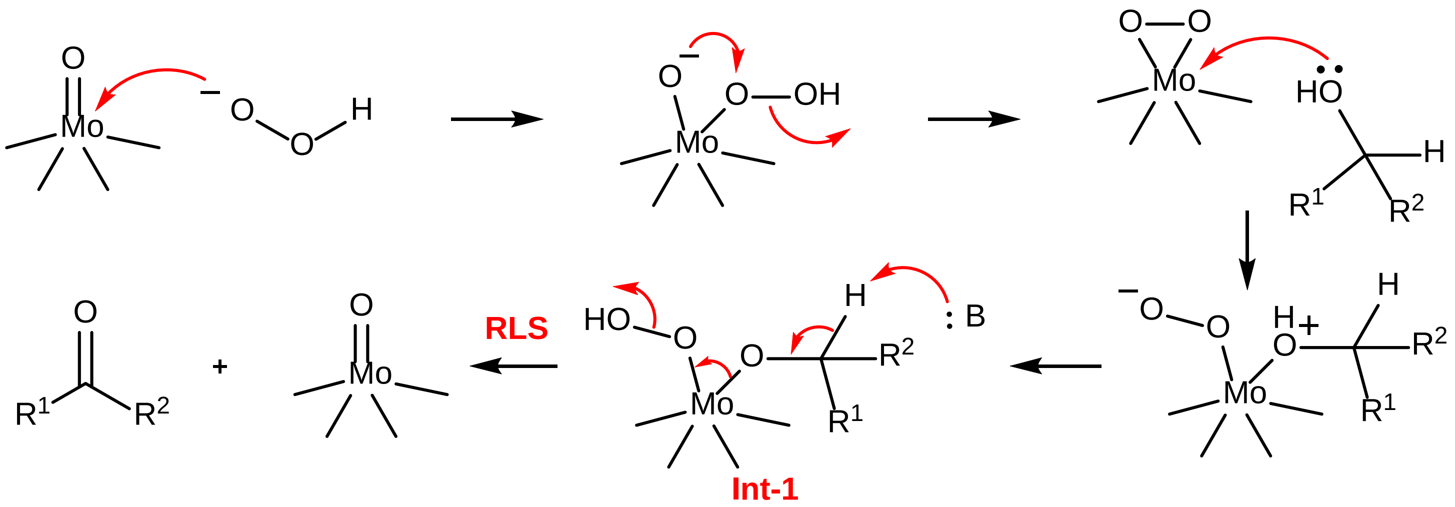
Monohydrosilanes afforded silyl enol ethers (1,4 adduct).
Dihydrosilanes afforded silyl ethers (1,2 adduct).

Reference: M. Miyashita*, K. Tanino, et al. *Science*, **2004**, *305*, 495-499.
Organometallics, **1982**, *1,* 1390.

Reaction 23:



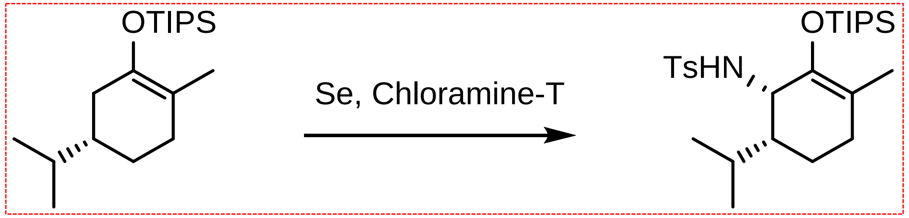
Mechanism:



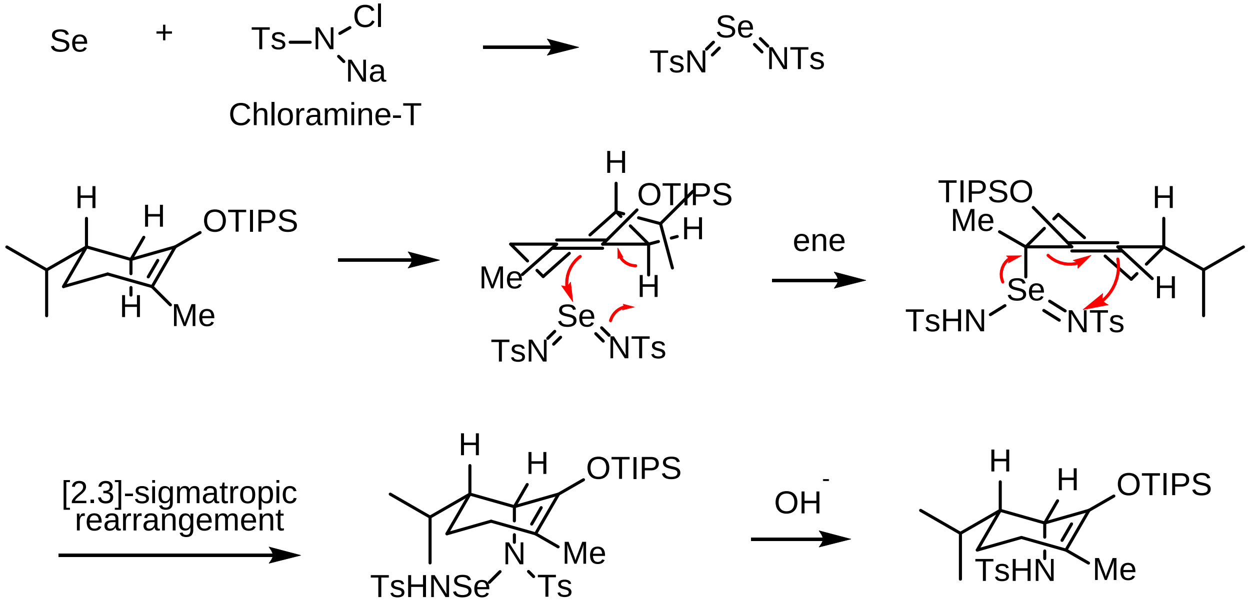
1) A secondary alcohol can be oxidized over a primary one.
2) A hindered alcohol can be oxidized in preference to a less hindered one.
3) The presence of potassium carbonate accelerates the reaction.
4) Steric acceleration of the decomposition of Int-1 appears to determine the overall rate of oxidation of saturated secondary alcohols.

Reference: M. Miyashita*, K. Tanino, et al. *Science*, **2004**, *305*, 495-499.
Tetrahedron Lett. **1984**, *25,* 173.

Reaction 24:

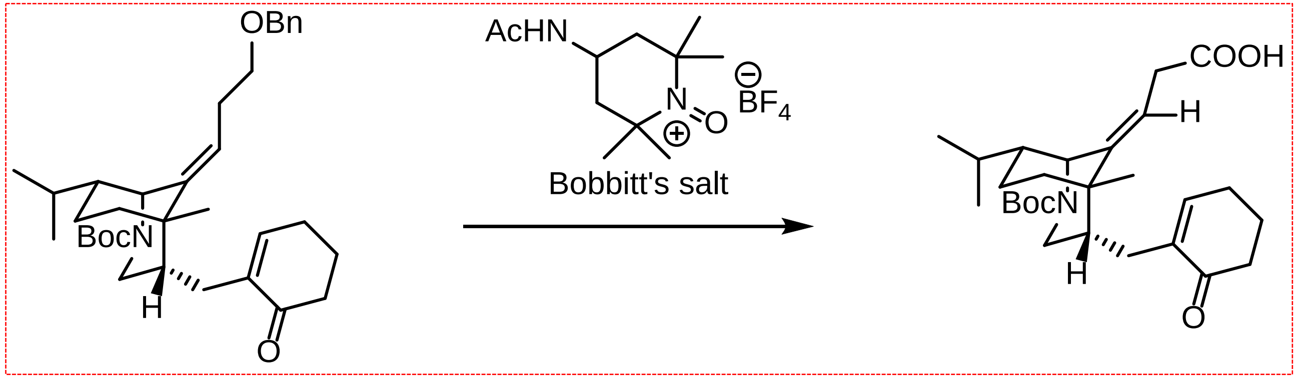


Mechanism:

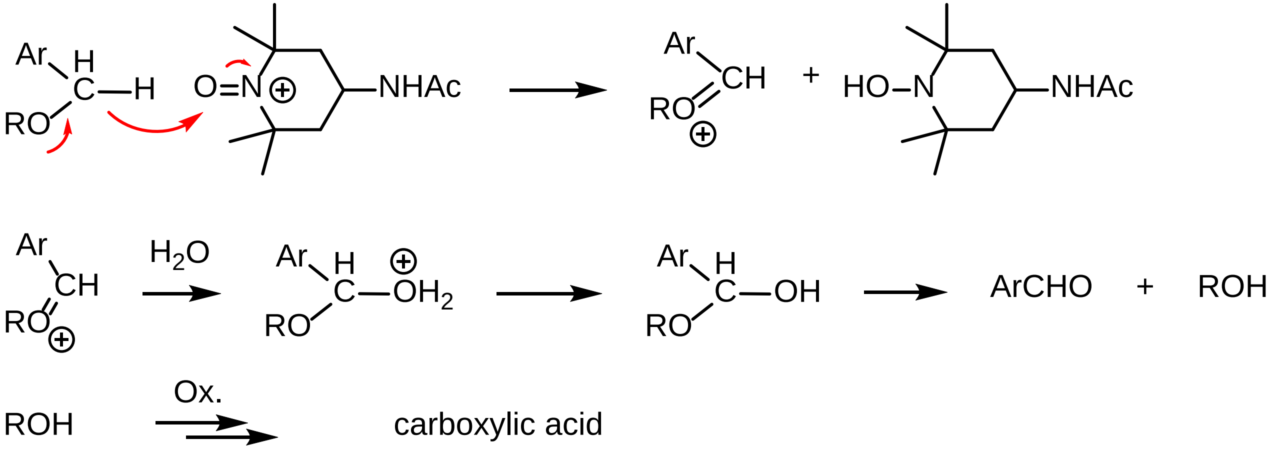


Reference: C. Li, et al. *J. Am. Chem. Soc.* **2020**, *142*, 15240-15245.
J. Am. Chem. Soc. **1976**, *98,* 269-271.
Tetrahedron **1995**, *51*, 11087-11110.

Reaction 25:

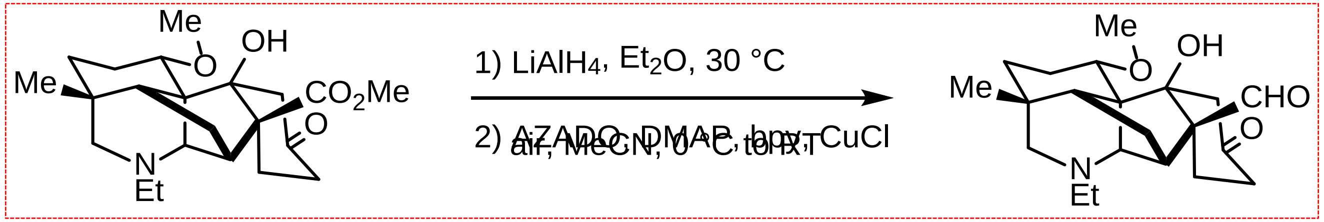


Mechanism:



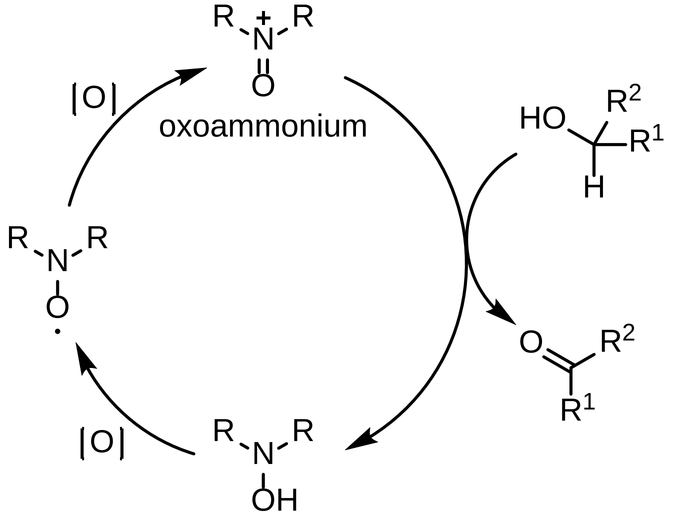
Reference: C. Li, et al. *J. Am. Chem. Soc.* **2020**, *142*, 15240-15245.
J. Org. Chem. **2009**, *74,* 9524-9527.

Reaction 26:

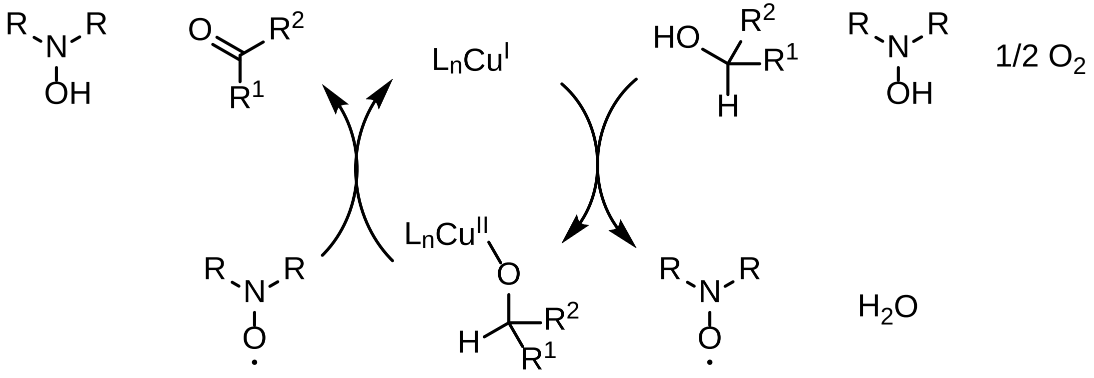


Mechanism:

1) Oxoammonium-based catalysis

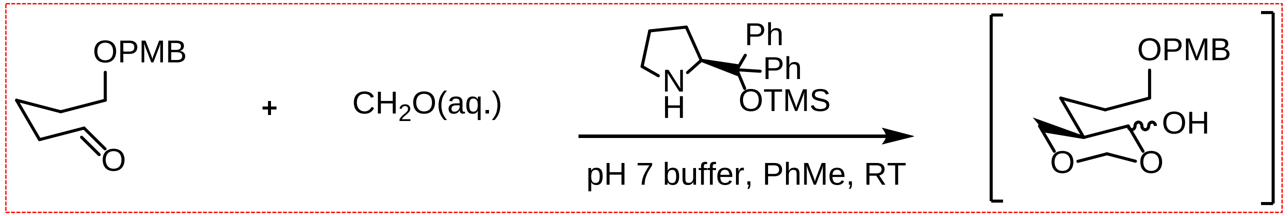


2) Nitroxyl radical/Copper catalysis

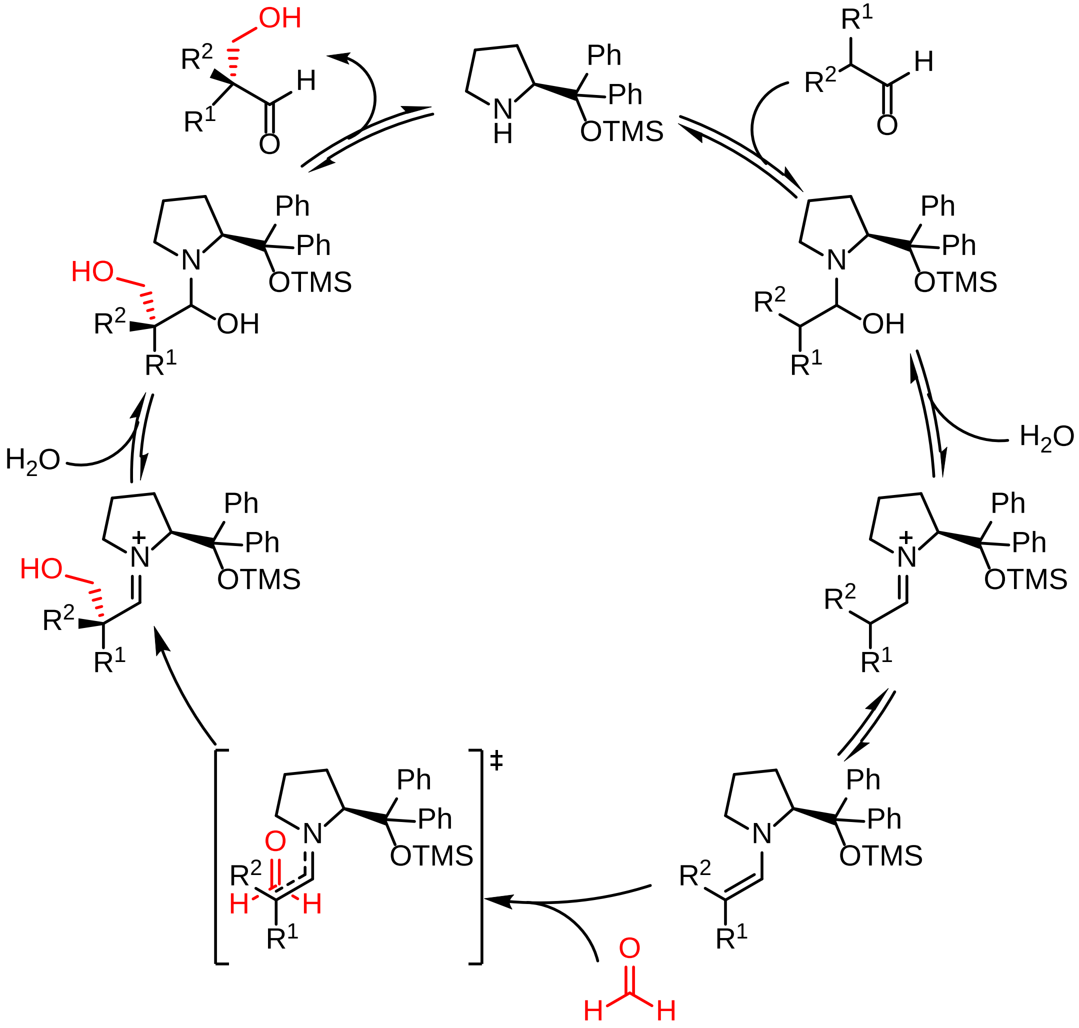


Reference: Y. Qin, et al. *Angew. Chem. Int. Ed*. 10.1002/anie.202011923
Angew. Chem. Int. Ed. **2014**, *53,* 3236-3240.

Reaction 27:



Mechanism:



Reference: Y. Qin, et al. *Angew. Chem. Int. Ed*. 10.1002/anie.202011923

J. Org. Chem. **2015**, *80,* 4030-4045.