

4.19: Extra Problems with Nucleophilic Substitution and Elimination

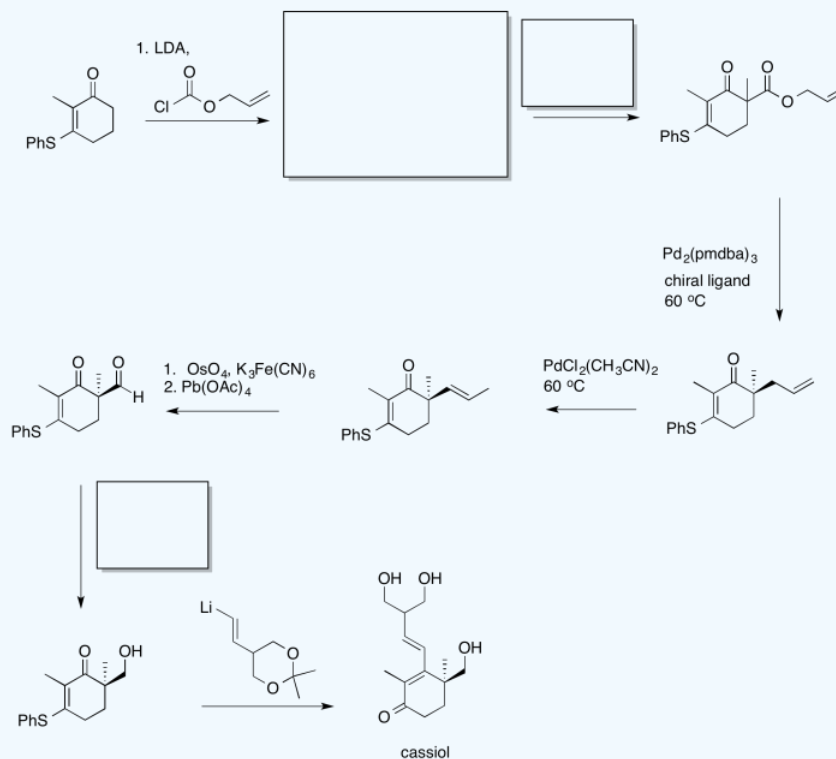
? Exercise 4.19.1

Fill in the missing items in the following synthesis. Includes: aliphatic nucleophilic substitution, carboxylic substitution, enolates, addition to carbonyl (anionic nucleophiles).

Synthesis of (+)-Cassiol

Stoltz (Caltech) 2008

Cassiol is a natural product of *Cinnamomum cassia* that displays potent antiulcerogenic activity in rats.



? Exercise 4.19.2

Fill in the missing items in the following synthesis. Includes: addition to carbonyls (anionic nucleophiles, neutral nucleophiles), aliphatic nucleophilic substitution, Mitsunobu reaction).



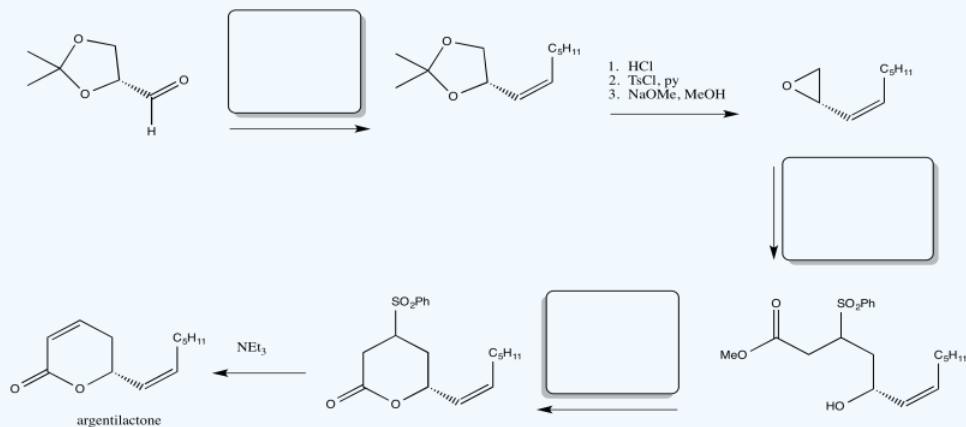
observed product

<https://chem.libretexts.org/@go/page/200815>



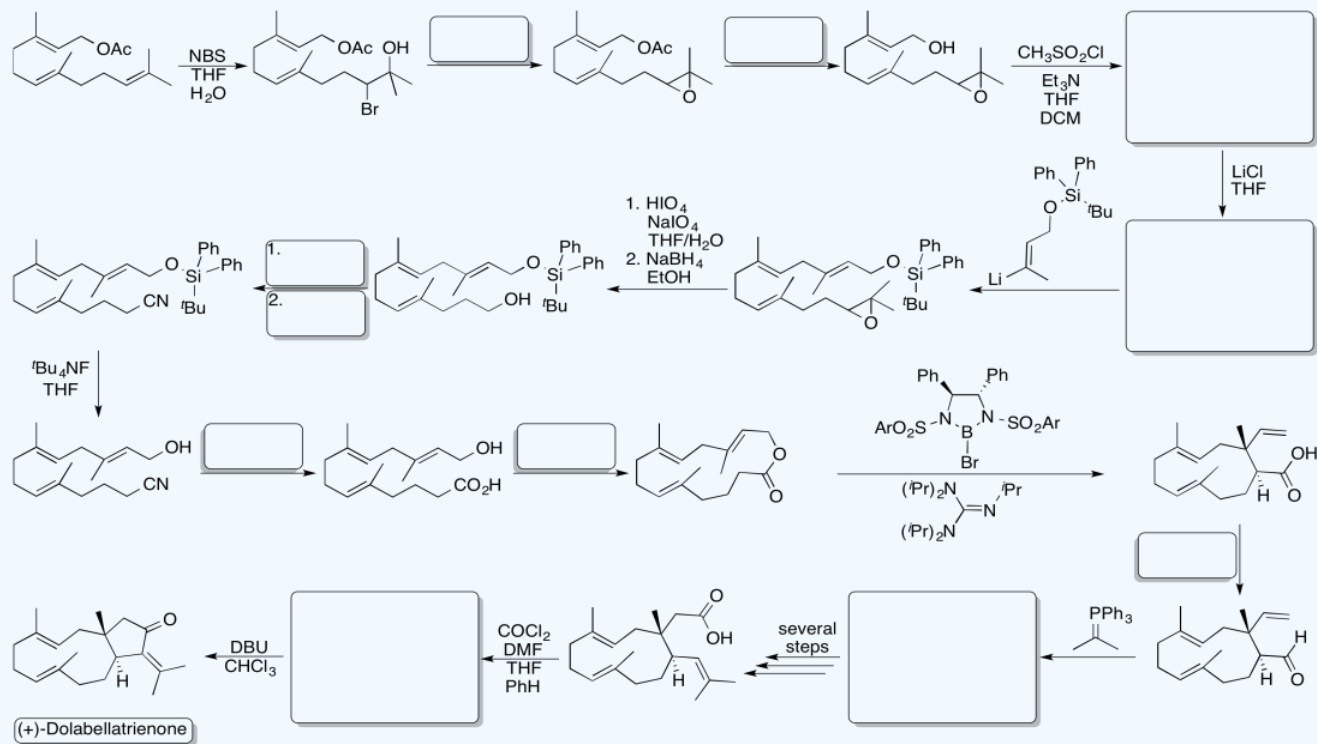
Argentilactone

Carretero and Ghosez, *Tetrahedron Lett.*, **1988**, 29, 2059.



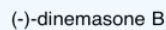
? Exercise 4.19.5

Fill in the missing items in the following synthesis. Includes: aliphatic nucleophilic substitution, carboxylic substitution, sulfonate substitution, addition to nitriles, addition to carbonyls (ylides).



? Exercise 4.19.6

Fill in the missing items in the following synthesis. Includes: aliphatic nucleophilic substitution, carbonyl addition (anionic nucleophiles, acetals, ylides), carboxylic substitution, silyl ethers.



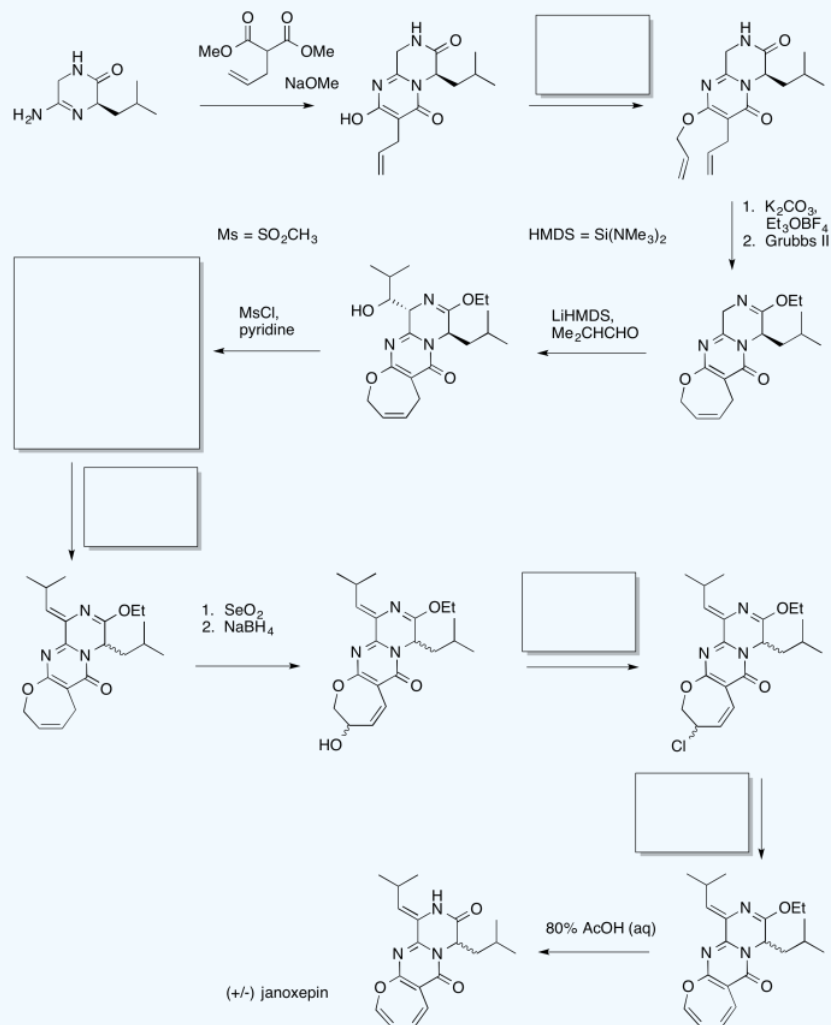
? Exercise 4.19.7

Fill in the missing items in the following synthesis. Includes: aliphatic nucleophilic substitution, sulfonate substitution, elimination.

Synthesis of janoxepin

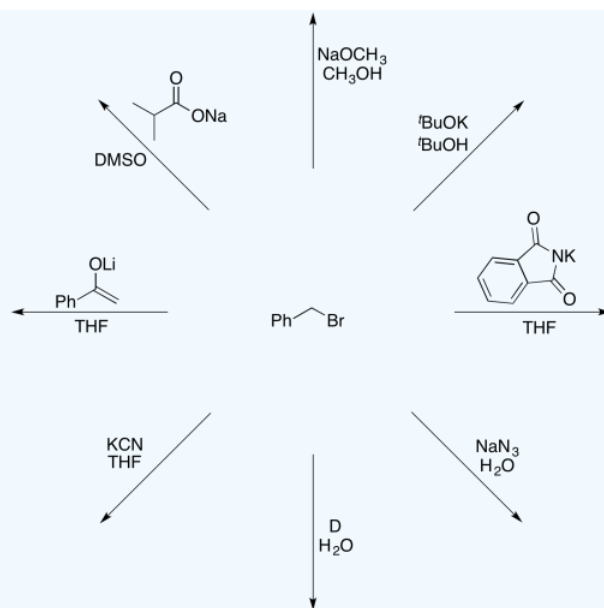
Richard Taylor et al, University of York, 2012

A fungal metabolite from *Aspergillus janus*, effective against the malaria parasite *Plasmodium falciparum*.



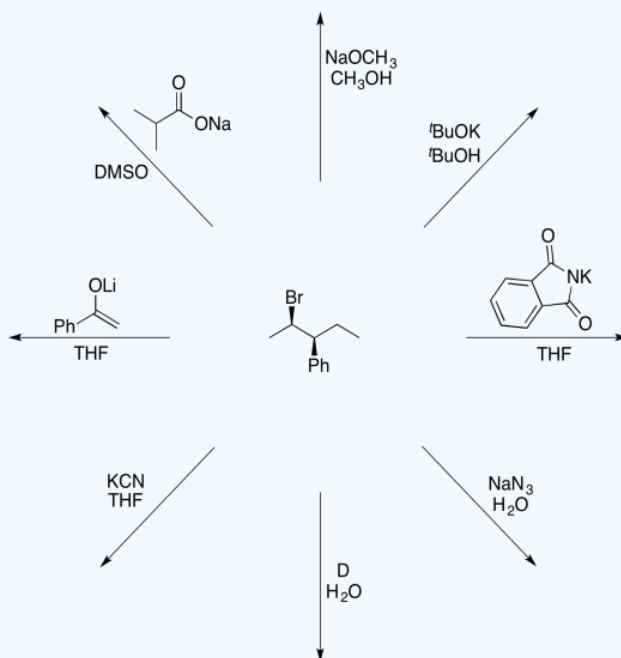
? Exercise 4.19.8

Predict products of the following reactions.



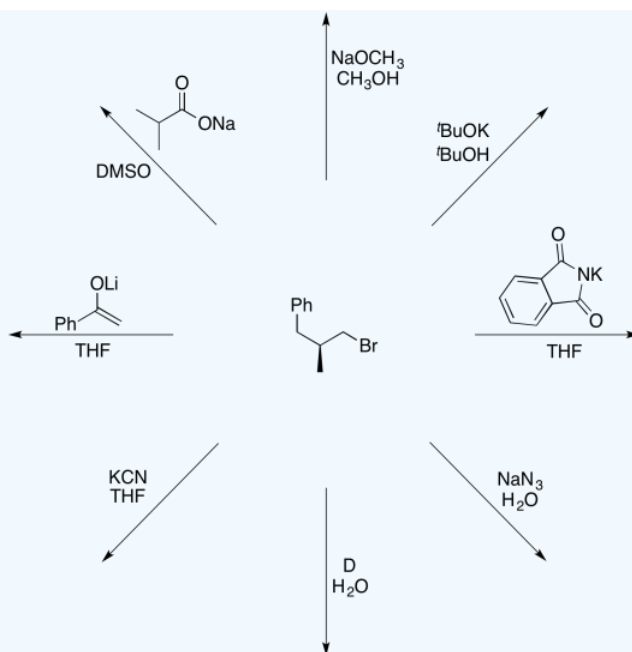
? Exercise 4.19.9

Predict products of the following reactions.



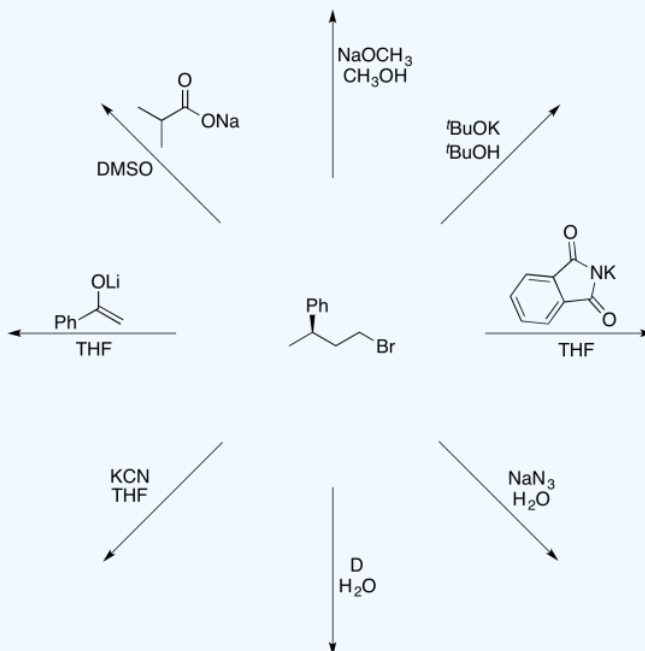
? Exercise 4.19.10

Predict products of the following reactions.



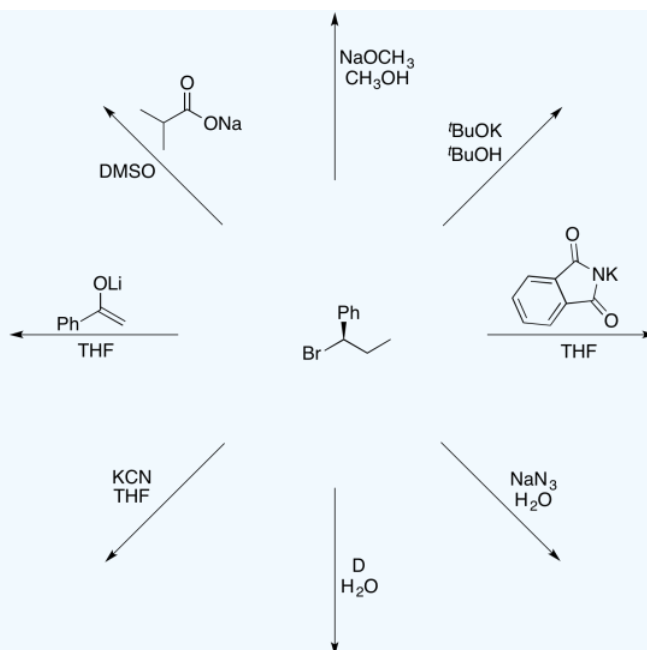
? Exercise 4.19.11

Predict products of the following reactions.



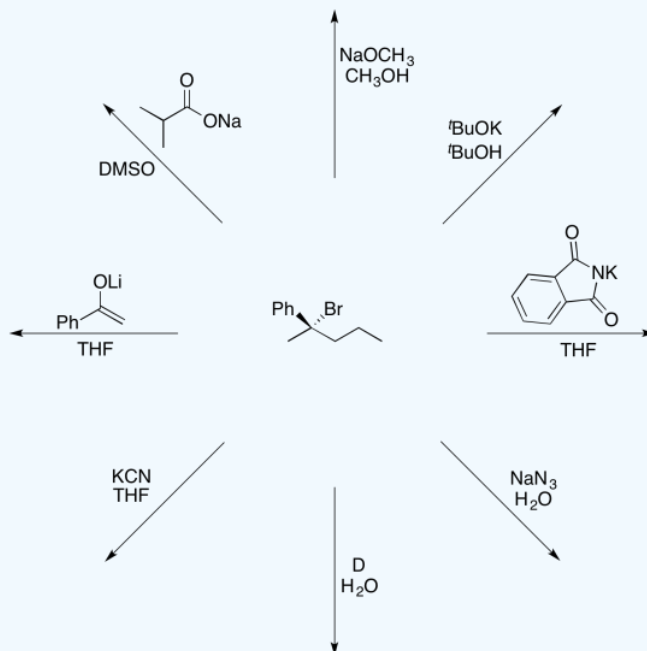
? Exercise 4.19.12

Predict products of the following reactions.



? Exercise 4.19.13

Predict products of the following reactions.



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