

**Stereoselective Methods in Synthesis and Catalysis****Reading**

Lecture Course (Dr Anderson (2<sup>nd</sup> year), Profs Donohoe and Gouveneur, 3<sup>rd</sup> year).

Problems cover the following topics (you should make notes on these topics):

Enamine and iminium ion catalysis – stereochemical models to predict both diastereocontrol and enantiocontrol.

Felkin-Anh, polar Felkin-Anh and Cram chelate models

Allylic strain

Evans auxiliary for alkylation (and general reactions with electrophiles)

Aldol reactions – dependence on enolate geometry

Sharpless Asymmetric Epoxidation (including kinetic resolution) and Dihydroxylation

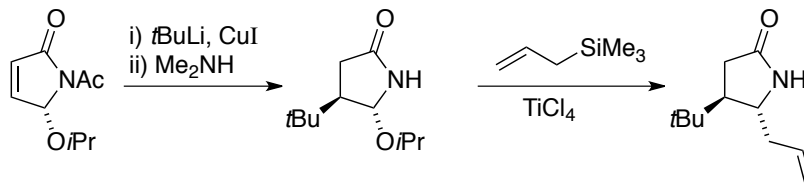
CBS reduction

Evans-Saksena , Prasad and Tishenko reductions

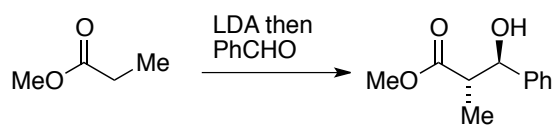
PROBLEMS

1. Give mechanisms and rationalise the observed stereochemical outcome in each of the following reactions.

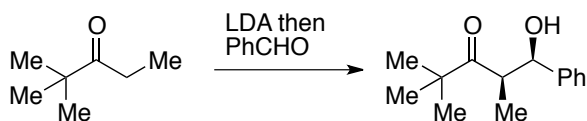
a)



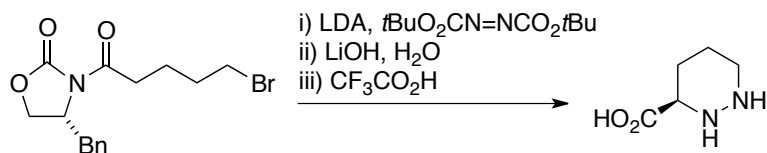
b)



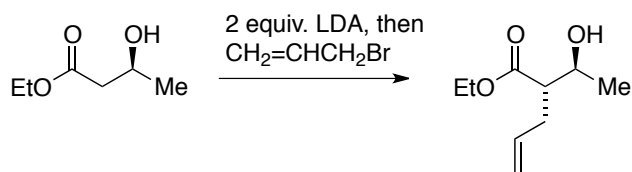
c)



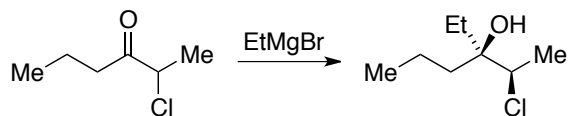
d)



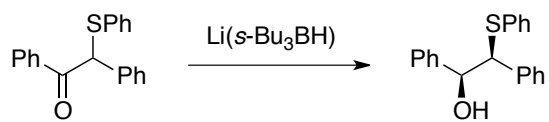
e)



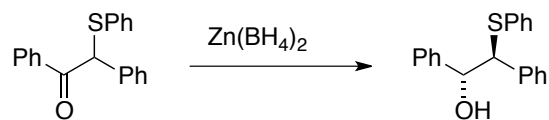
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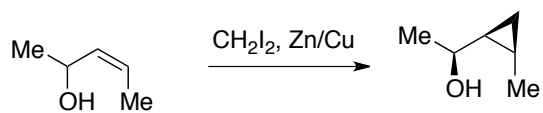
g)



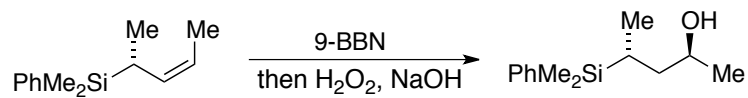
h)



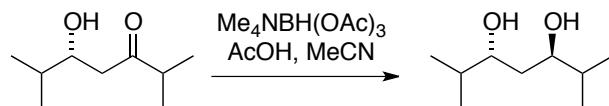
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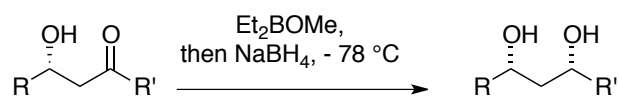
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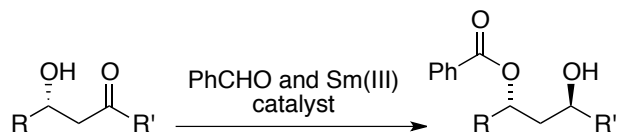
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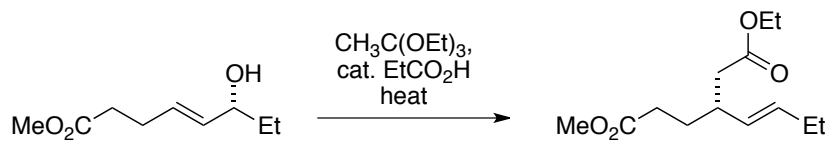
l)



m)

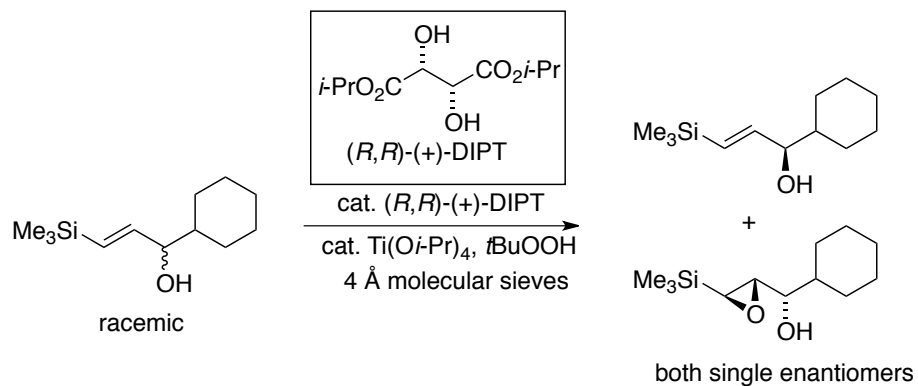


n)

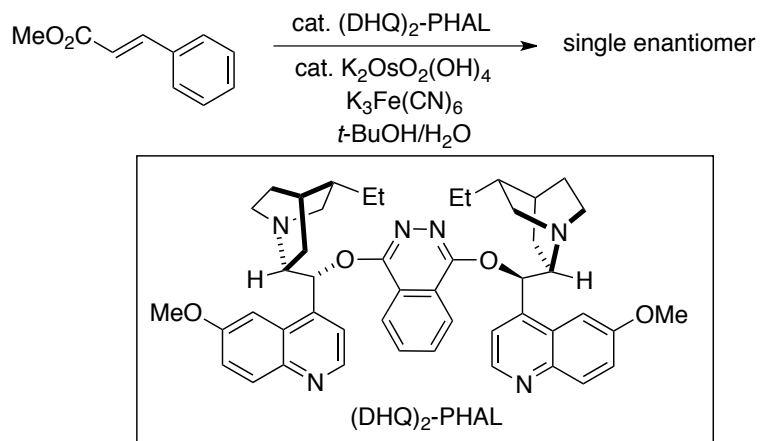


2. Predict or rationalise the stereochemical outcome of the following catalytic asymmetric transformations.

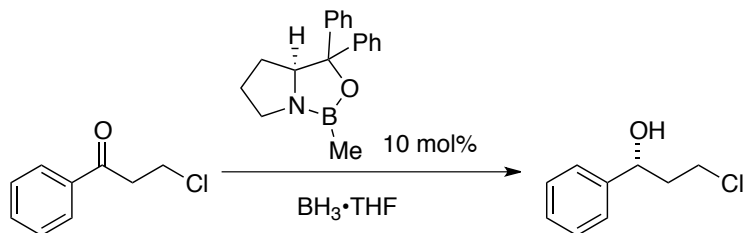
a)



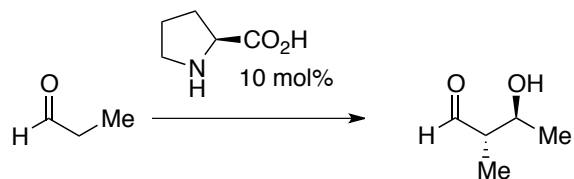
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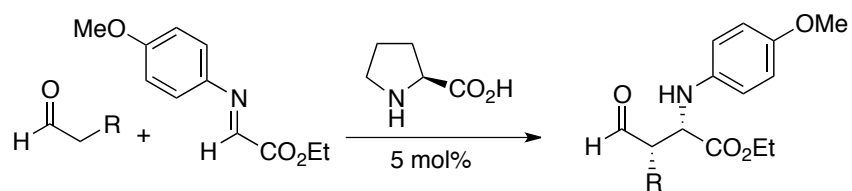
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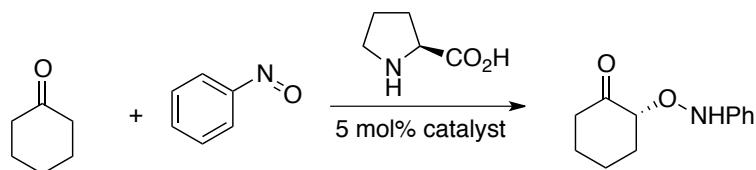
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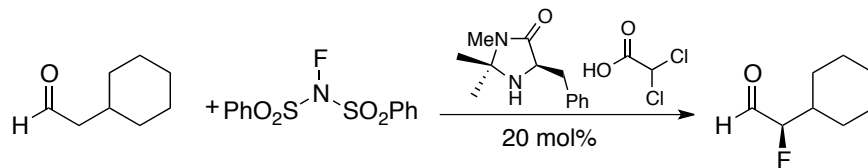
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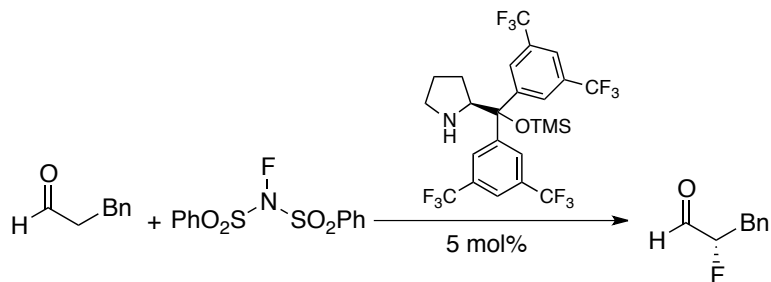
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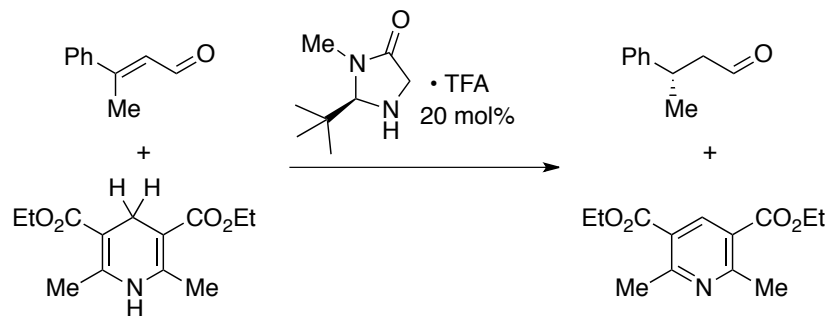
g)



h)



i)



## Synthesis

### Reading

Lecture Course (Prof. Donohoe 3<sup>rd</sup> year).

For each of the following make notes which explain the term and give (at least) one example.

1. Umpolung

2. Resolution and kinetic resolution

5. Draw these common protecting groups for alcohols (ROH): RO-TBS; RO-MOM; RO-Bn; RO-Ac. How are they put on and taken off?

6. Draw these common protecting groups for amines (RNH<sub>2</sub>): RNH-Boc; RNH-Cbz; RNH-Fmoc. How are they put on and taken off?

7. Retrosynthesis

8. Synthon

5. How would you synthesise the following molecules from simple starting materials.

