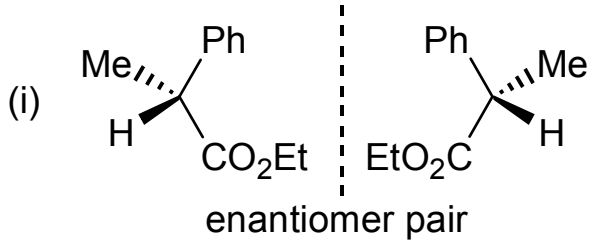
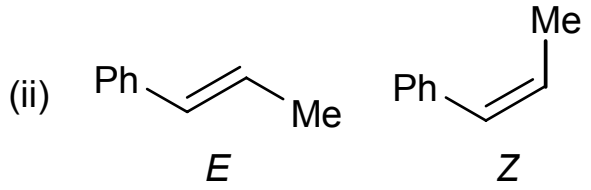
Stereochemistry and Reaction Mechanisms

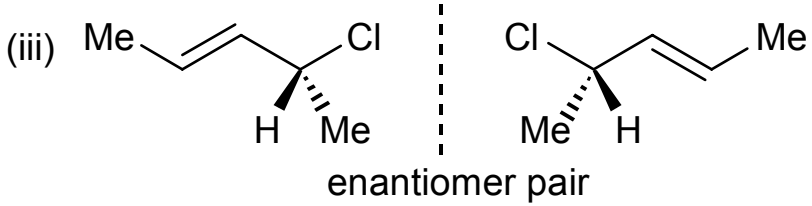
Answers to Examples Class

1.

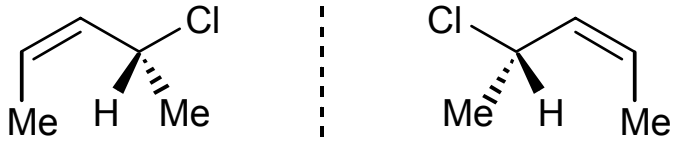


enantiomer pair

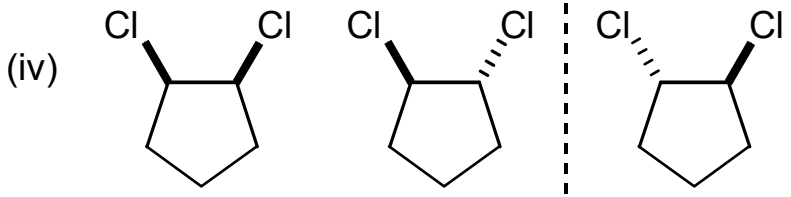




enantiomer pair



enantiomer pair

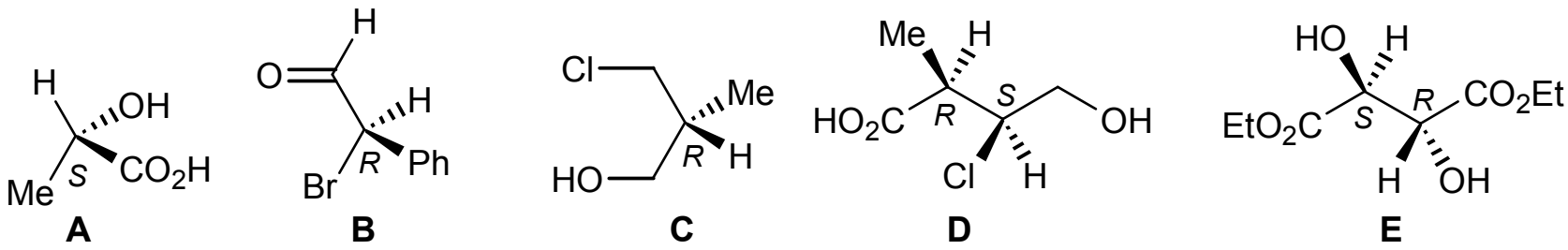


meso

enantiomer pair

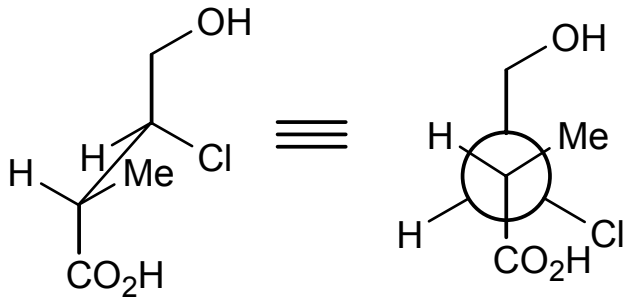
2.

(i)

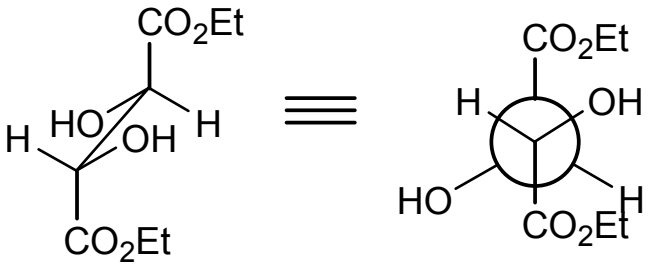


(ii)

D

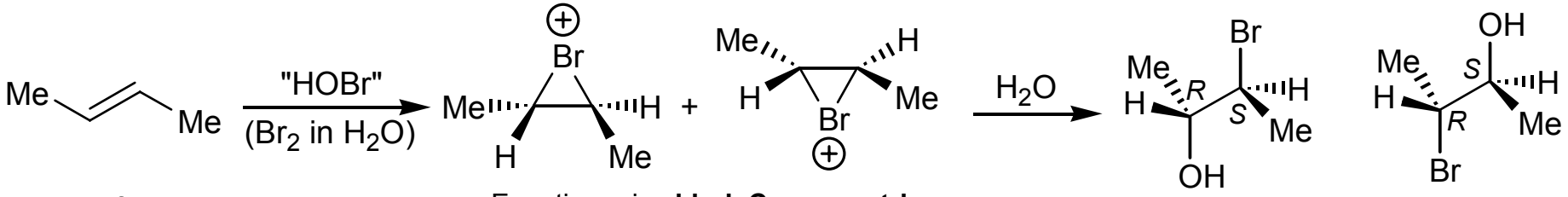


E



3.

(i)

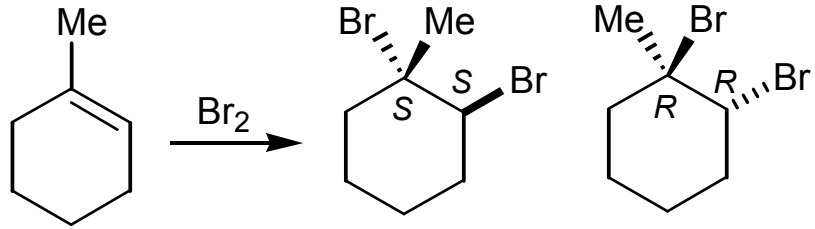


Attack of the alkene from either face is equally likely

Enantiomeric **chiral, C_2 symmetric** bromonium ions. For each enantiomer, attack at either carbon is equivalent.

Racemic mixture of enantiomeric products.

(ii)



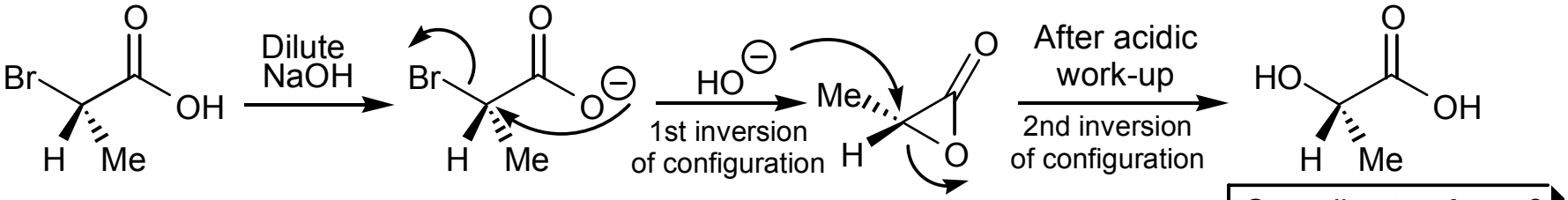
Attack of the alkene from either face is equally likely

Racemic mixture of enantiomeric products.

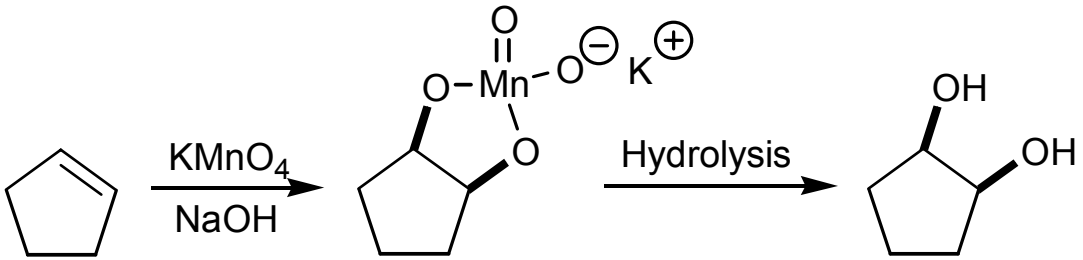
NB: Bromide ion most likely attacks at the more substituted end of the intermediate bromonium ion (significant S_N1 character to the reaction)

4.

(i)

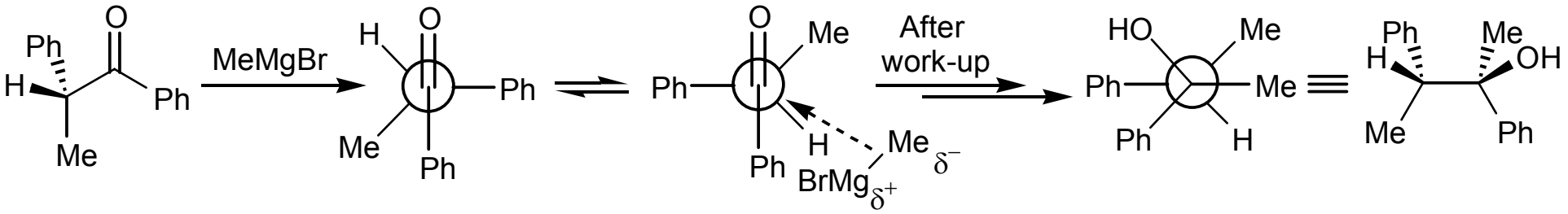


(ii)

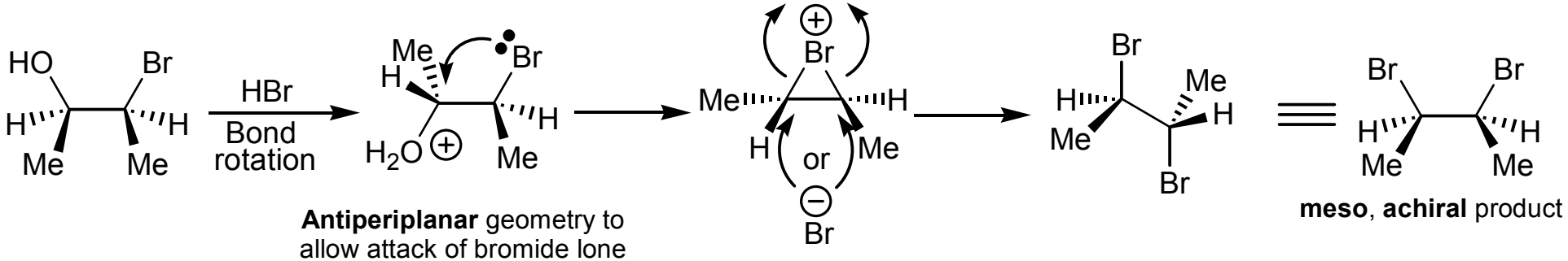


stereospecific cis-dihydroxylation

(iii) Felkin-Anh model



(iv)



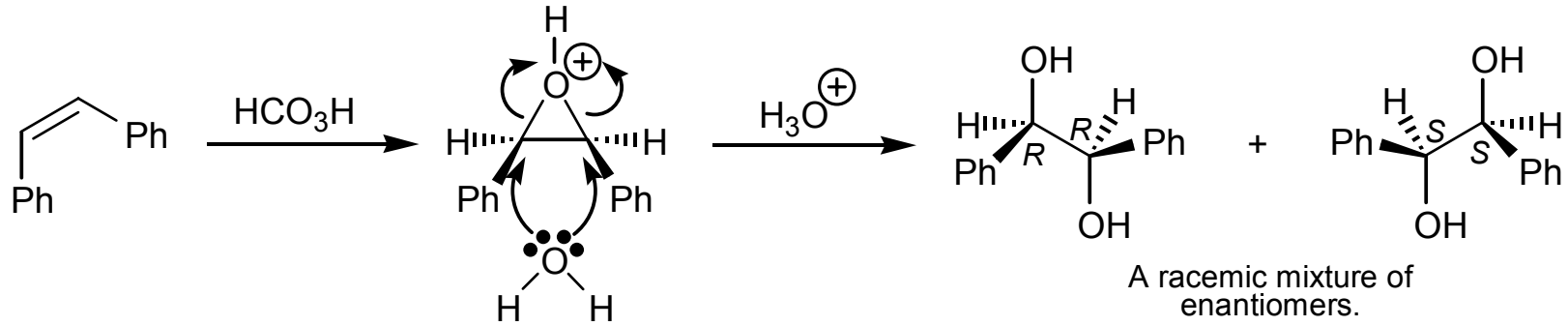
Antiperiplanar geometry to allow attack of bromide lone pair 180° to leaving group

A C_2 symmetric **chiral** cyclic bromonium ion. Due to the C_2 symmetry, attack at either of the two possible positions is now **equivalent**.

meso, **achiral** product

5.

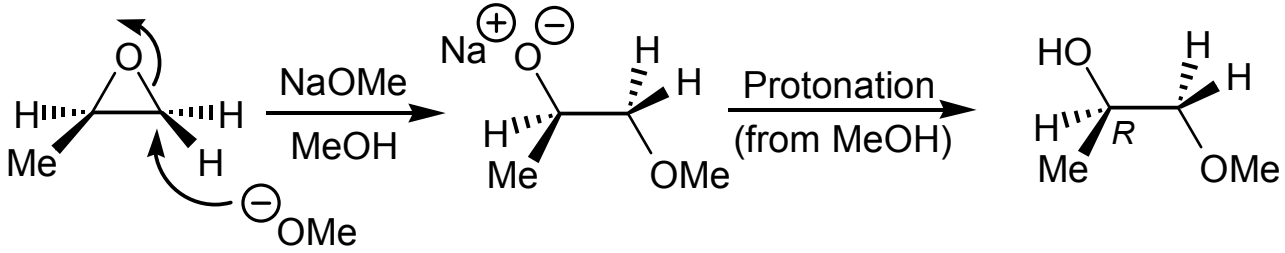
(i)



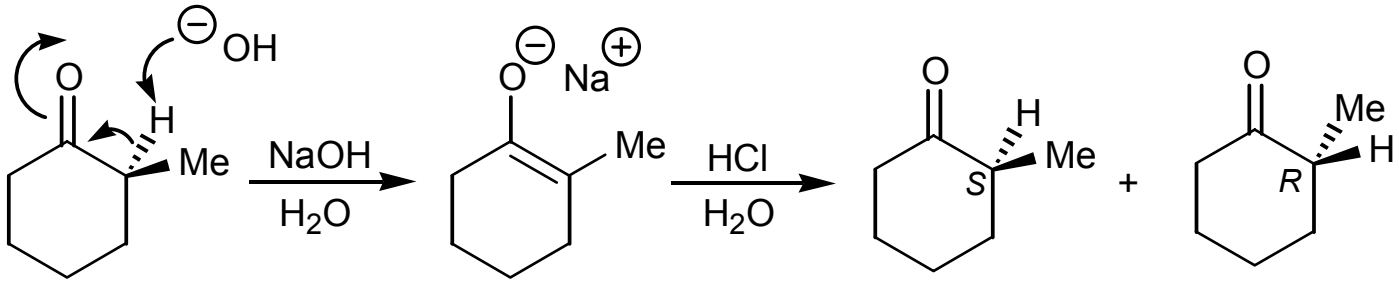
A **meso** (achiral) epoxide. Attack of water at either of the two possible positions is equally likely.

A racemic mixture of enantiomers.

(ii)



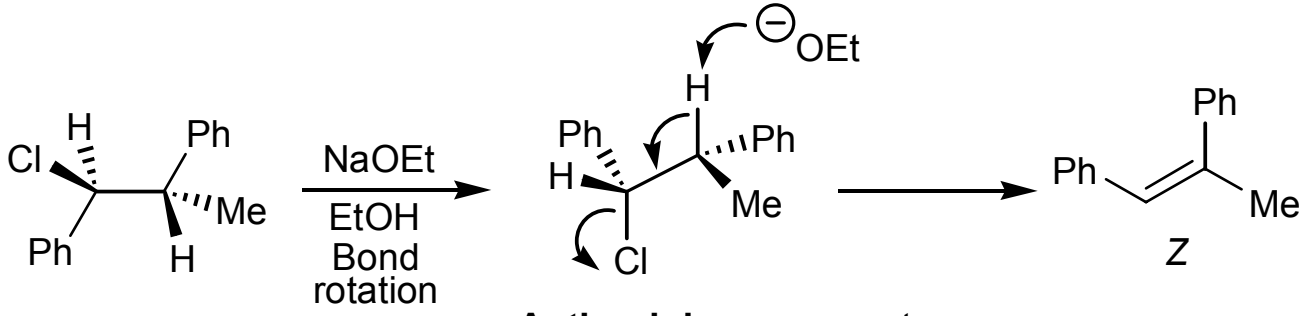
(iii)



Planar (achiral) enolate ion. Protonation can take place from either the top or the bottom face with equal probability.

A racemic mixture of enantiomers.

(iv)



Antiperiplanar geometry