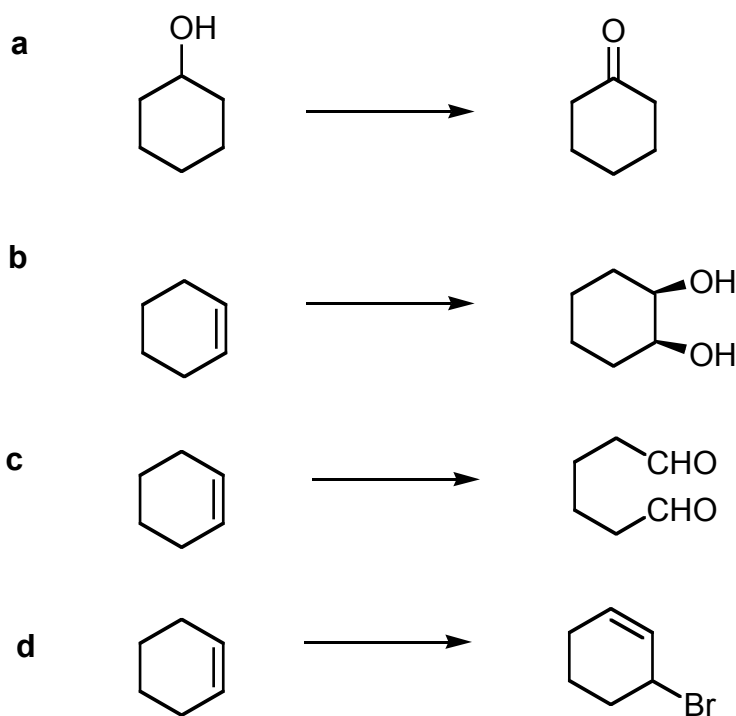


6. Answer Part I and Part II.

Part I.

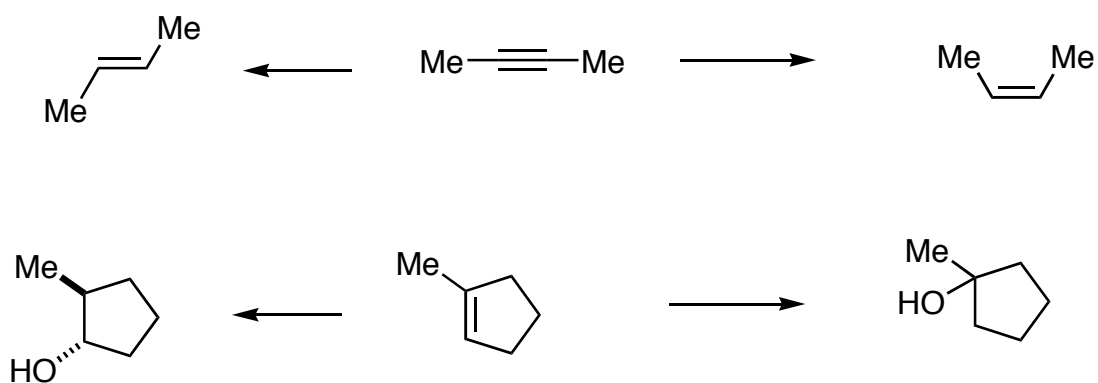
Suggest reagents for **each** of the following synthetic transformations. More than one step may be required. Give mechanisms for your proposed reactions.

[4 x 3]



Part II. Suggest reagents for achieving each of the following transformations:.

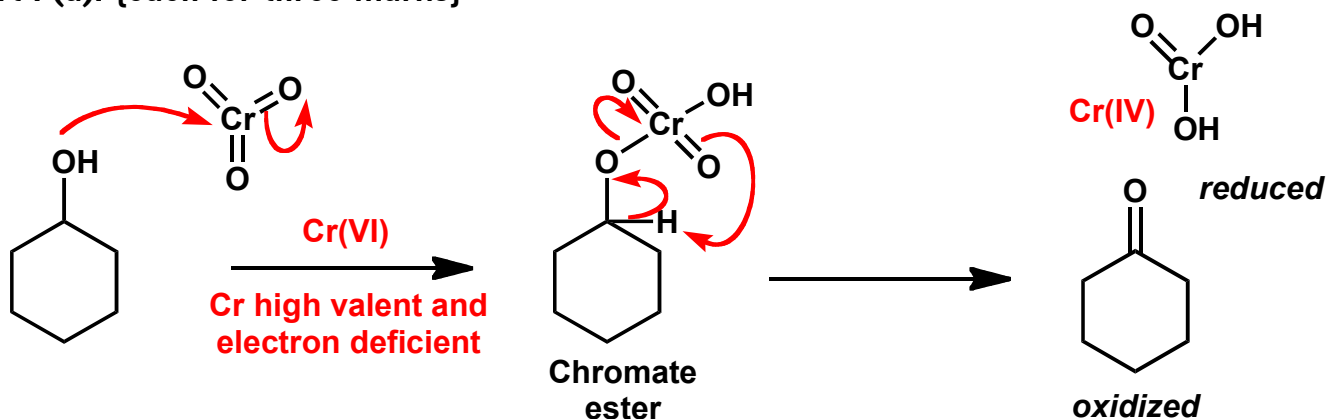
[2 x 4]



Turn over

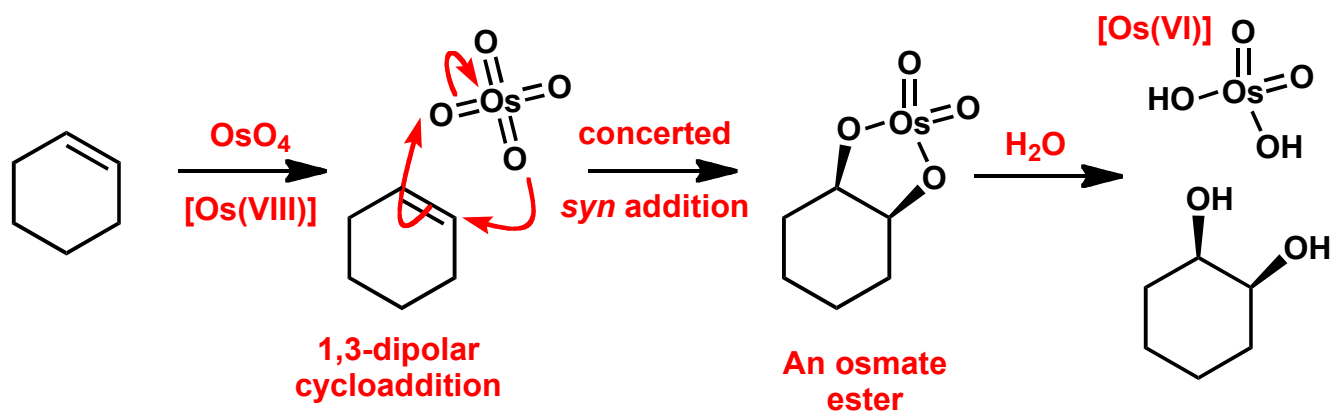
Long Vacation Prelim (resit), 2003, Q6.

Part I (a). {each for three marks}



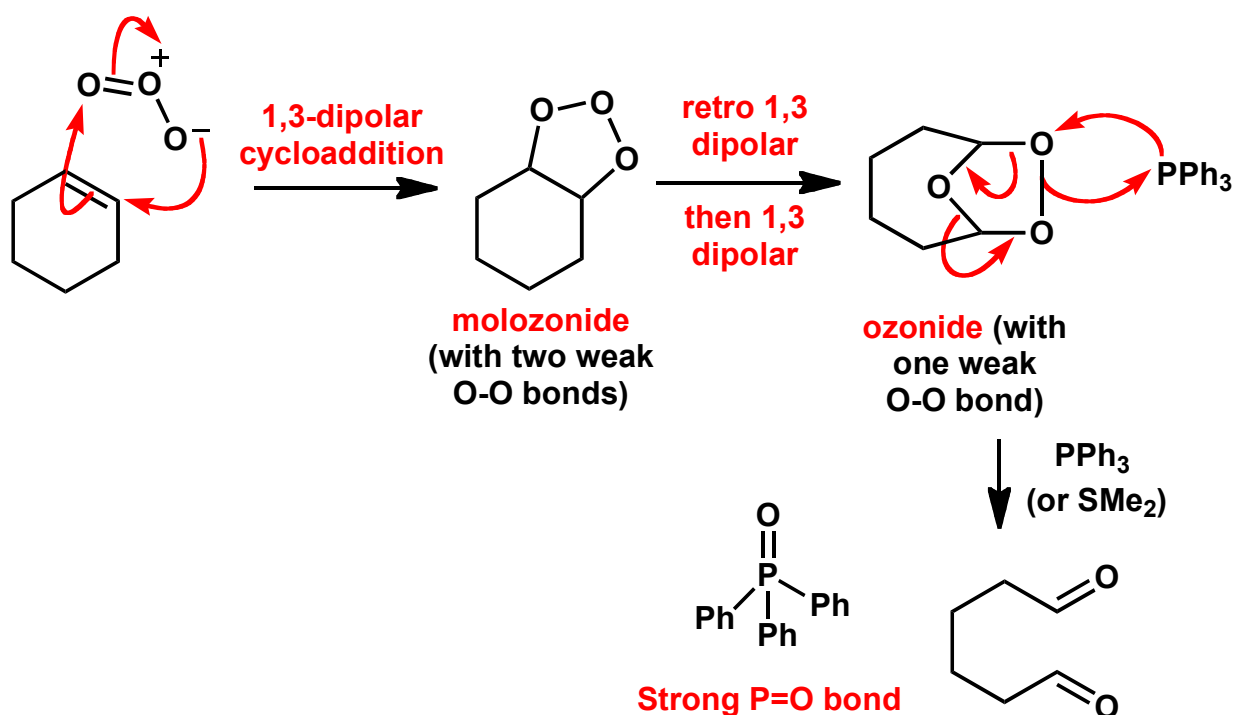
RDS is breakdown of chromate ester and not formation

(b). Stereospecific dihydroxylation



The reaction is stereospecific (the *cis* alkene geometry is transferred to the product)
The concerted nature of the osmylation leads to *syn*-dihydroxylation

(c). Ozone is used to cleave alkenes (see lecture notes for complete mechanism)

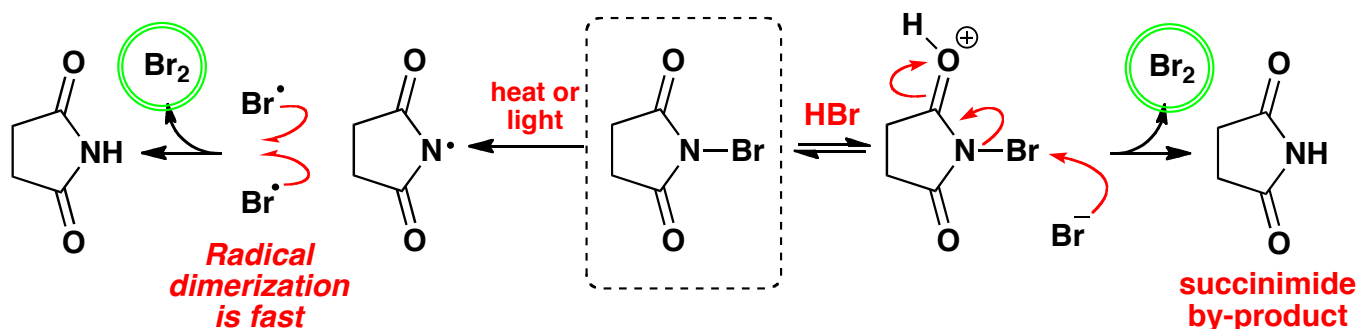


Long Vacation Prelim (resit), 2003, Q6.

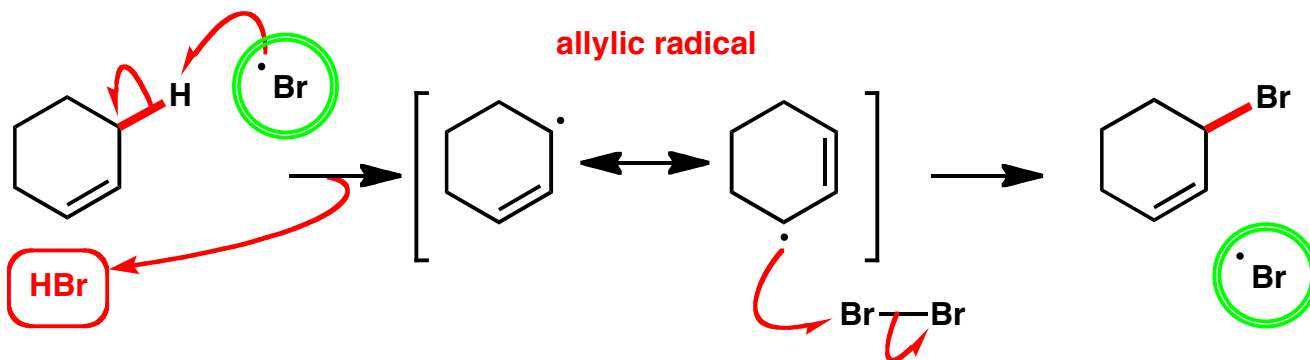
Part I (d). {each for three marks}

Allylic bromination: Reagents – *N*-bromo succinimide, a peroxide and heat or light

1. NBS is a source of molecular bromine (at a low, steady state concentration)

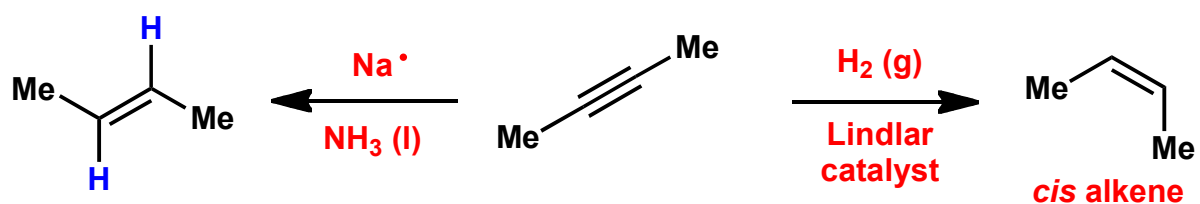


2. Hydrogen abstraction to give the most stable radical



Part II.

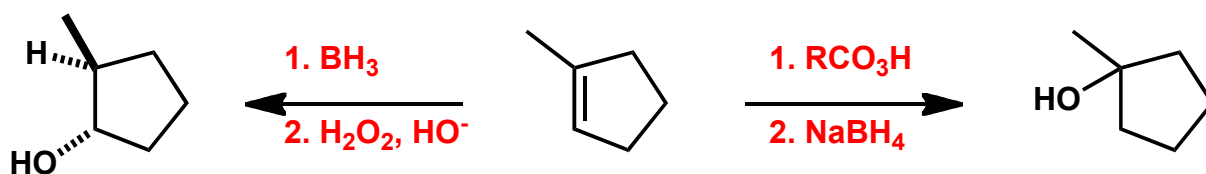
Alkyne reduction: see p18/19 handout 1 for complete mechanisms



Reagents: Na, liquid NH_3

Reagents: H_2 , lindlar catalyst
(Pd, CaCO_3 , $\text{Pb}(\text{OAc})_2$)

For hydroboration mechanism see p 12 handout 1; for epoxidation mechanism see p 11



Overall *syn* addition of water across the alkene
OH to least hindered end

1. Stereospecific *syn* epoxidation
2. Hydride opening of epoxide at least hindered end