

**B.Sc. Semester-VI
Group-A / DSE-4
Organic Synthesis**

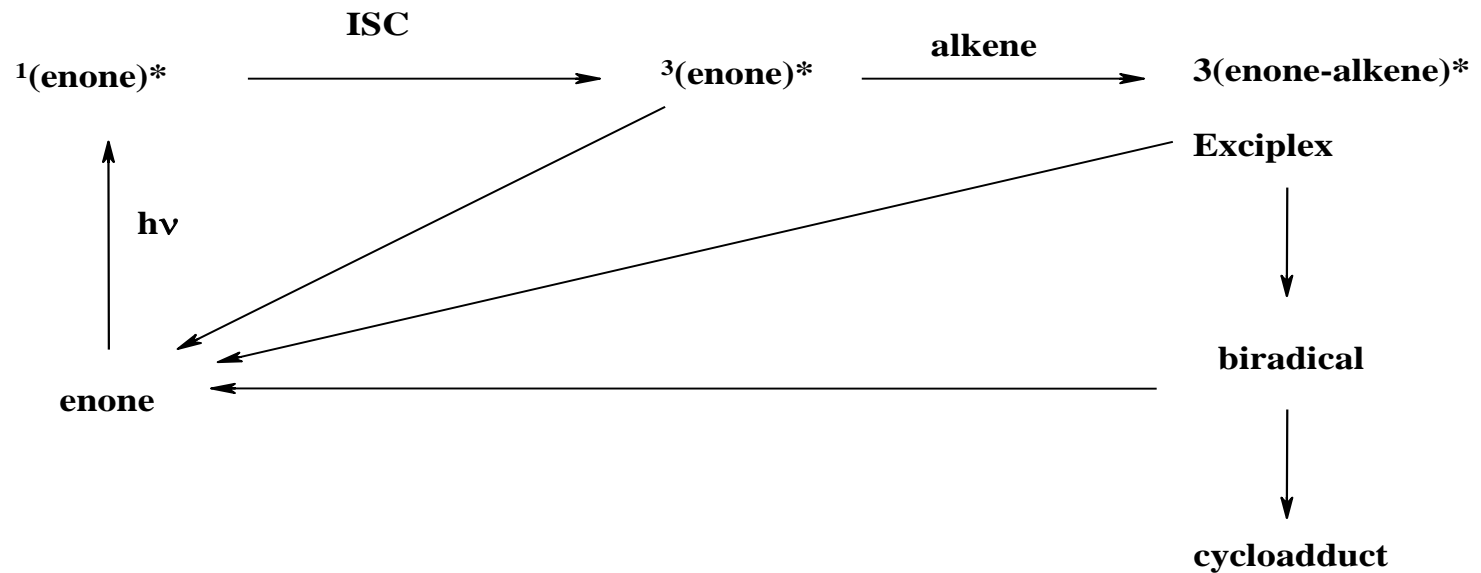
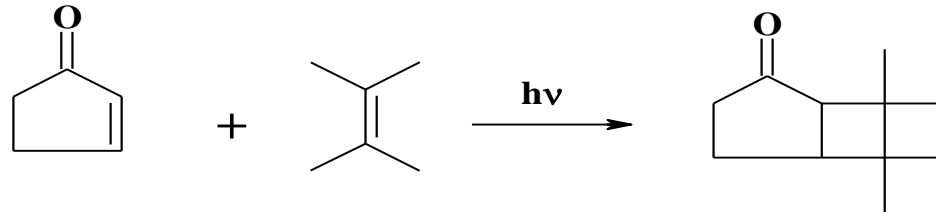


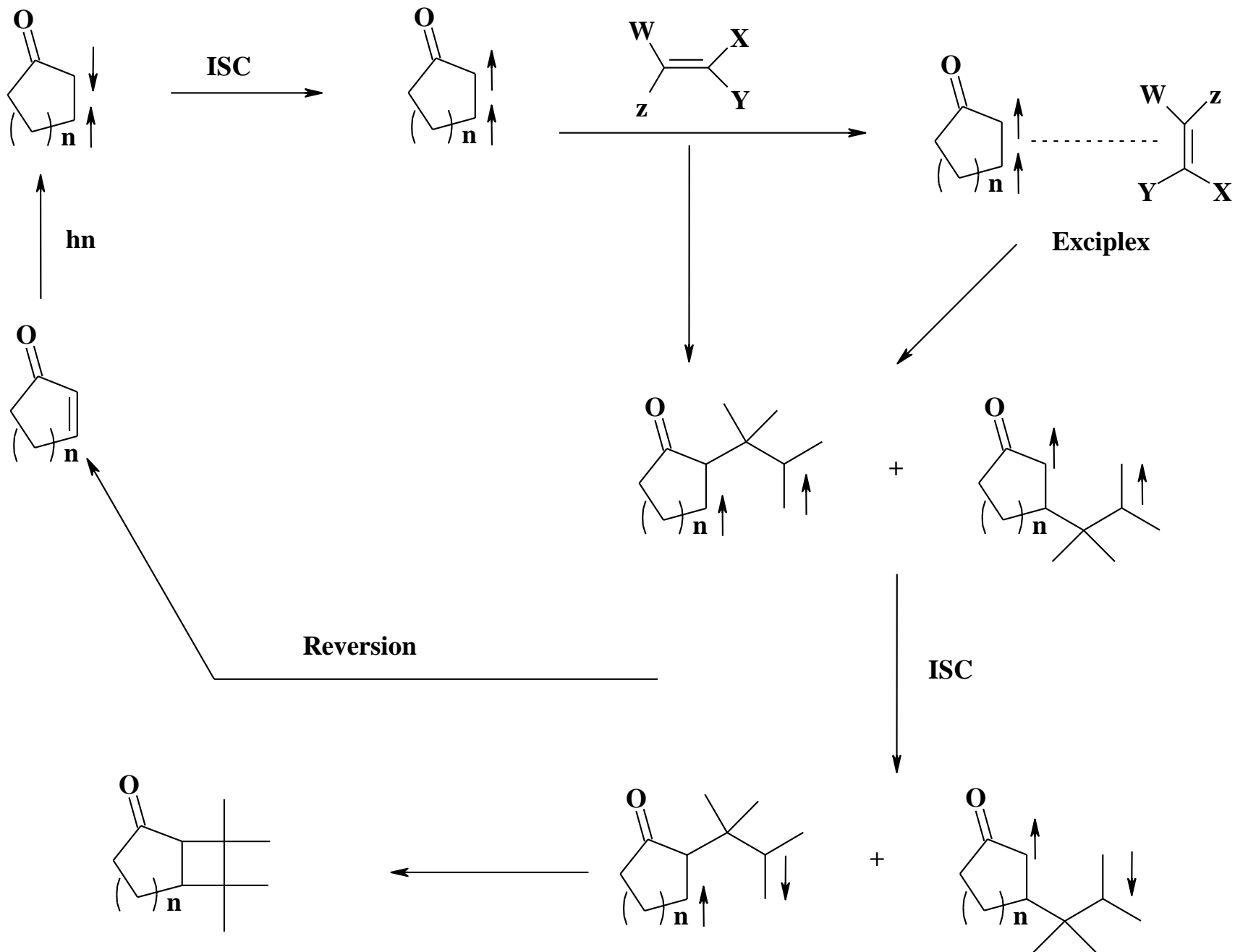
**III. Photochemistry
10. Photochemical Cycloaddition Reaction**

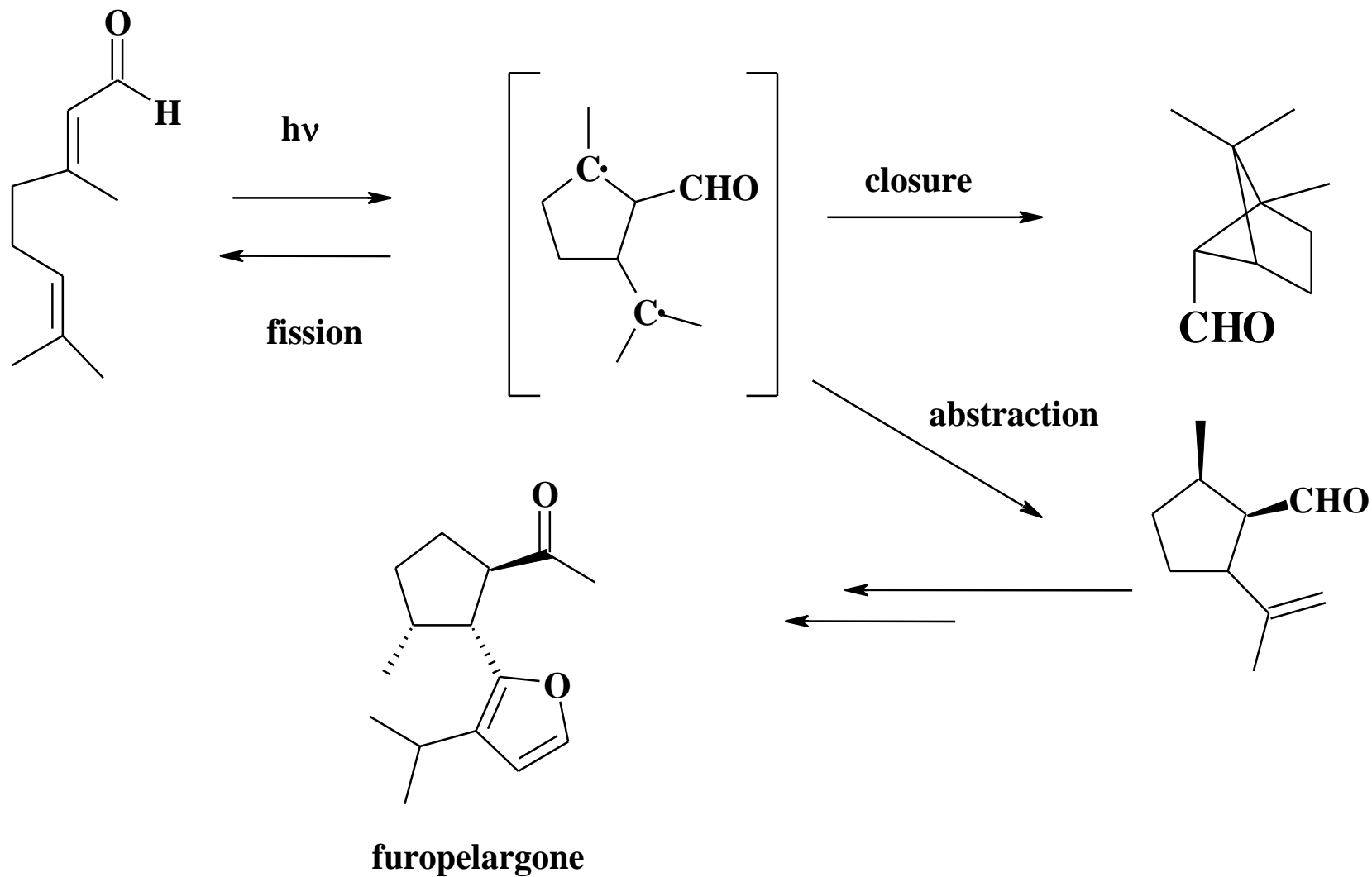


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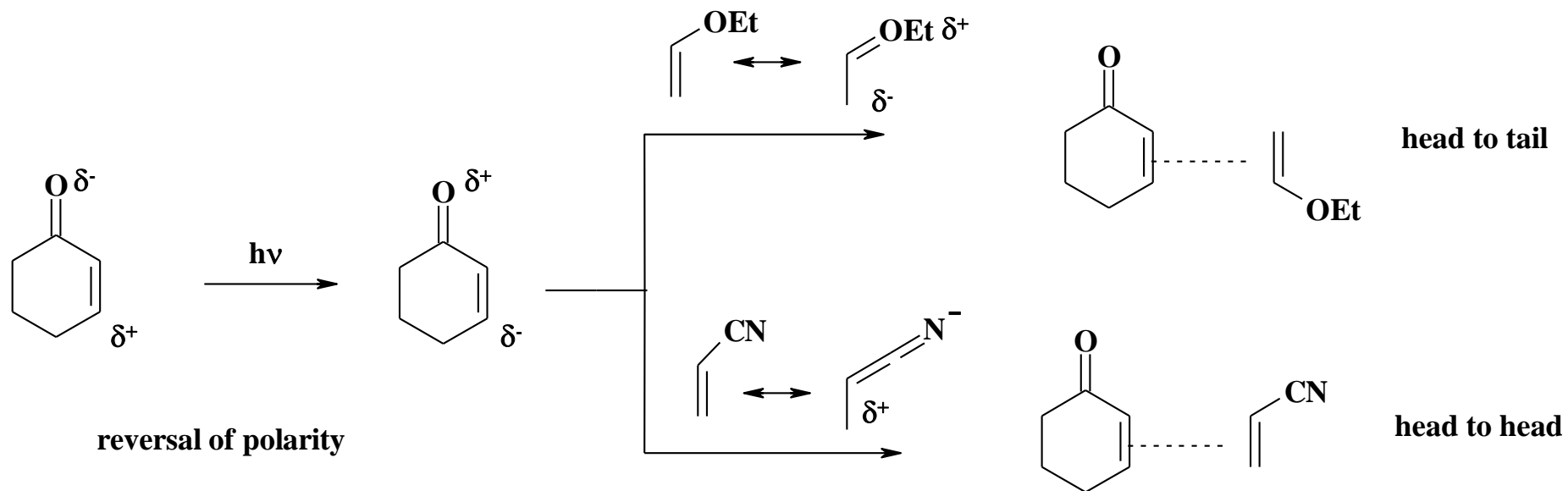
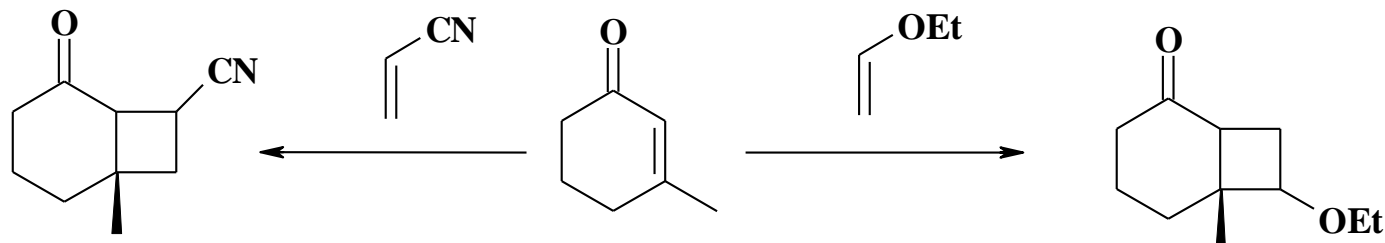
**Photochemical cycloaddition reaction
(enone olefin cycloaddition)**

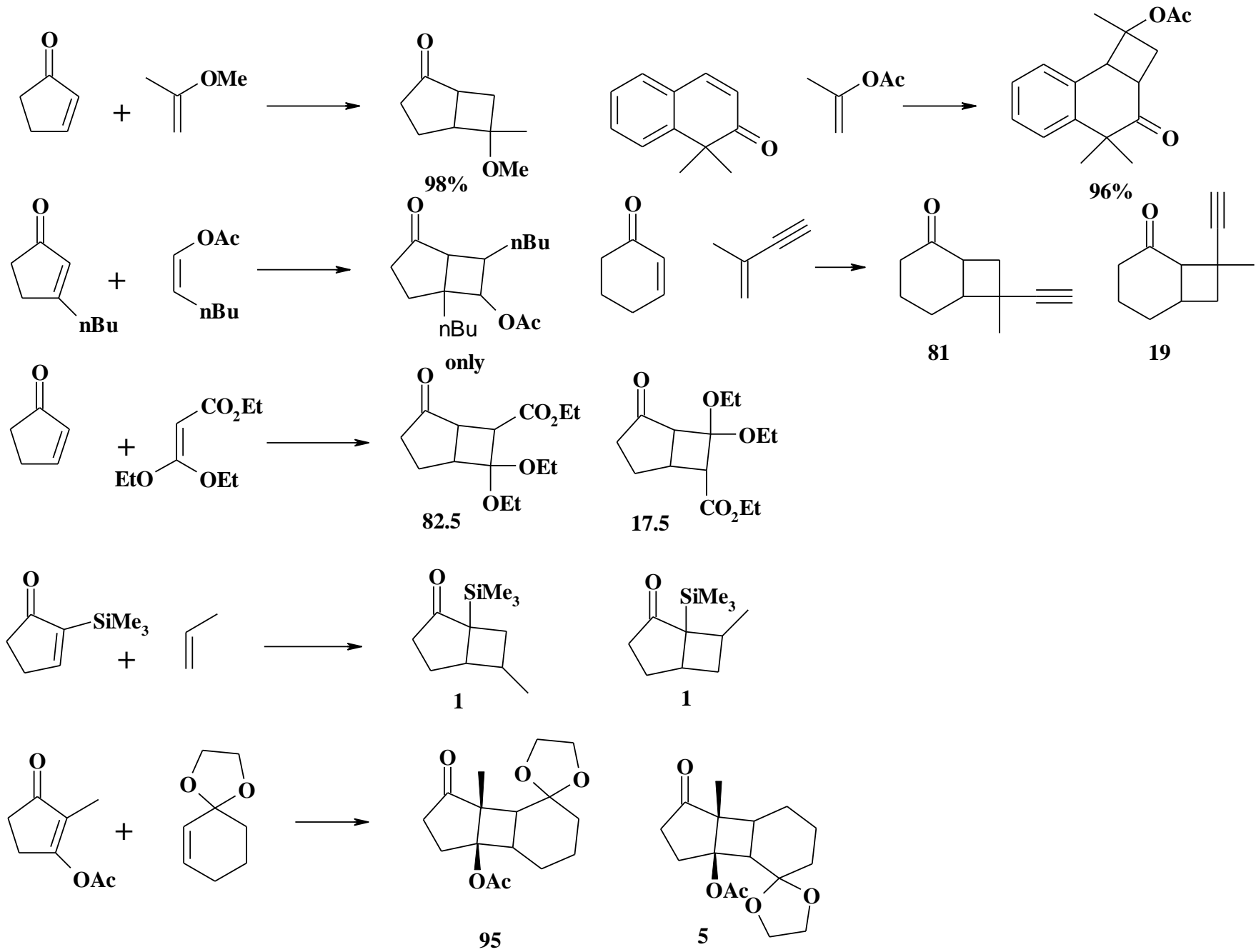


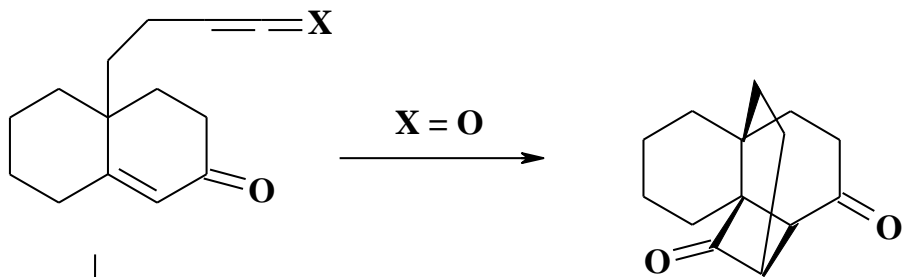




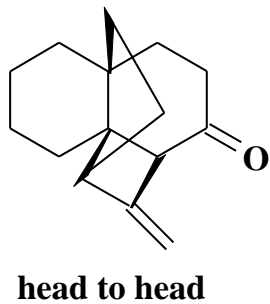
Regiochemistry of enone cycloaddition



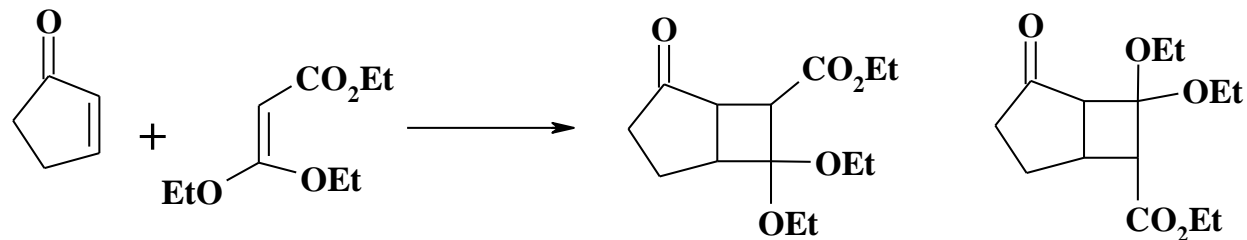




head to tail



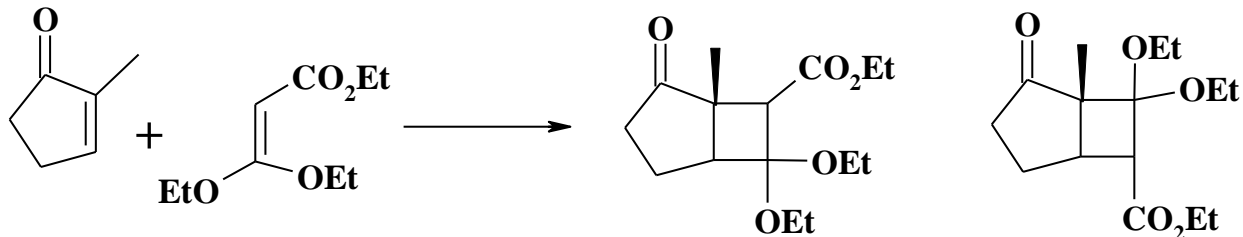
head to head



RT
-40°C

82.5
94

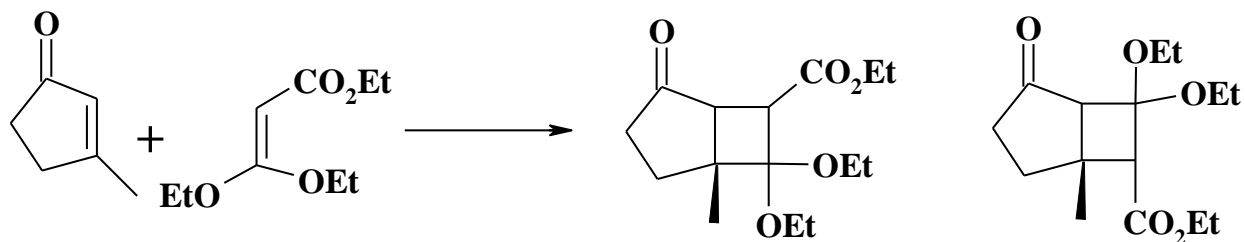
17.5
6



RT
-40°C

83.5
91.5

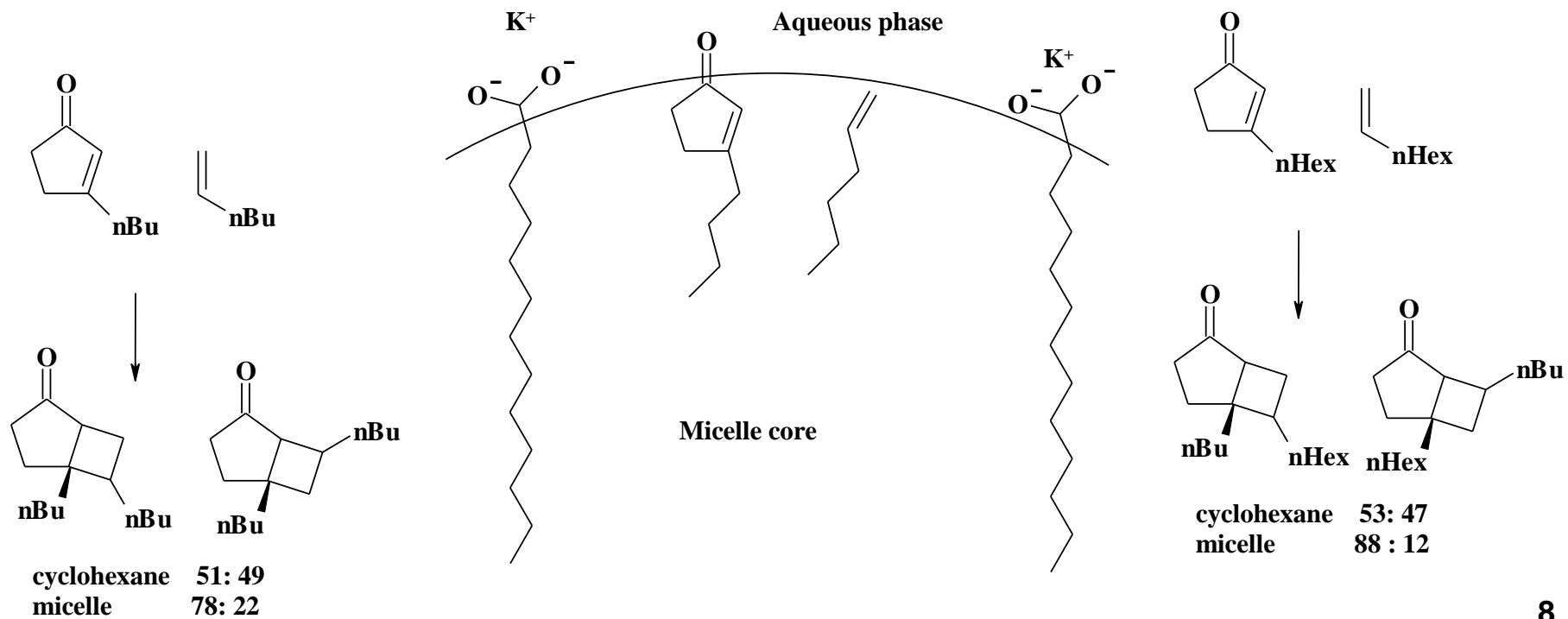
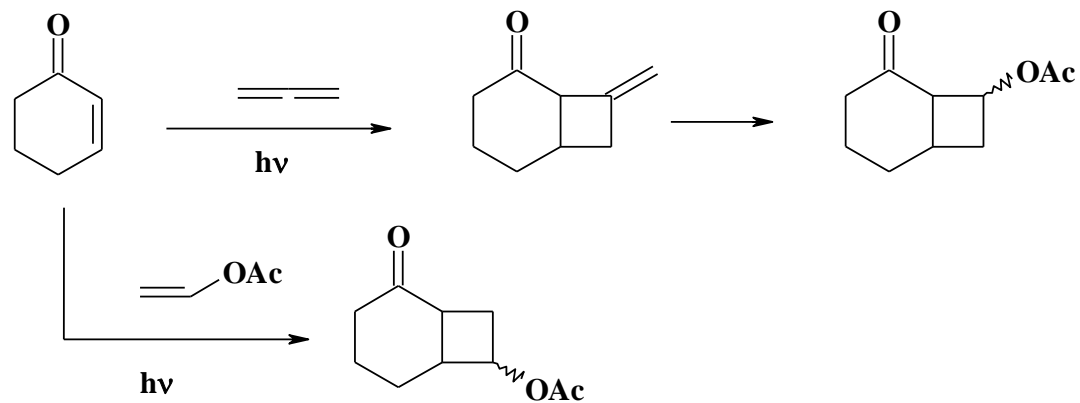
16.5
8.5



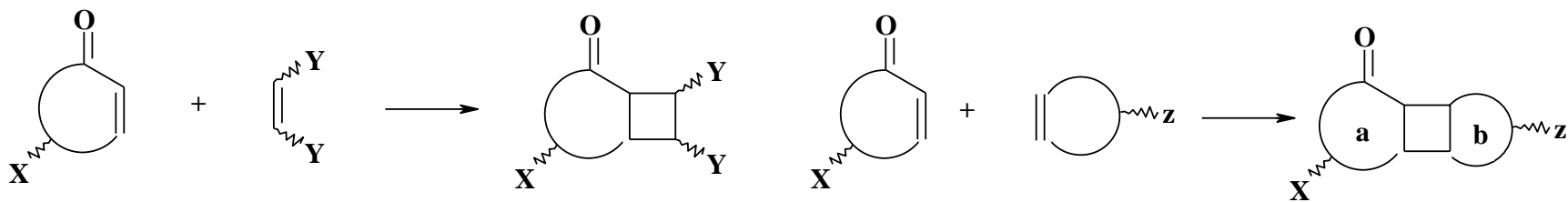
RT
-40°C

71
100

29
0

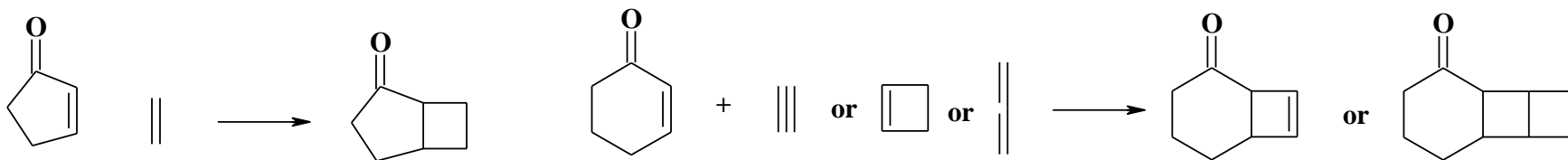


Stereochemistry of enone cycloaddition

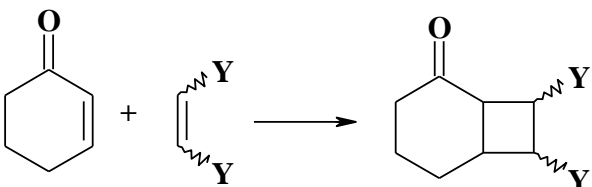


1. ring junction stereochemistry
2. exo or endo (Y)
3. cis or trans with respect to each other (y)
4. effect of remote substituents X

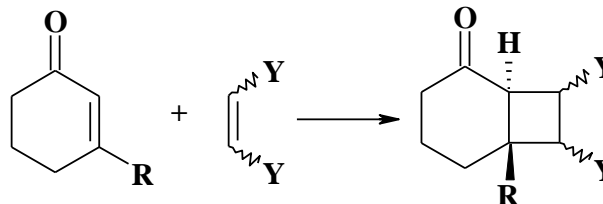
1. ring fusion stereochemistry
2. stereochemistry of a wrt b or vice versa
3. Remote substituents effect (X and Z)



always cis ring fusion

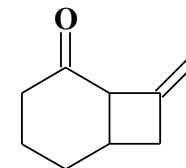


can be cis or trans
cis is favored

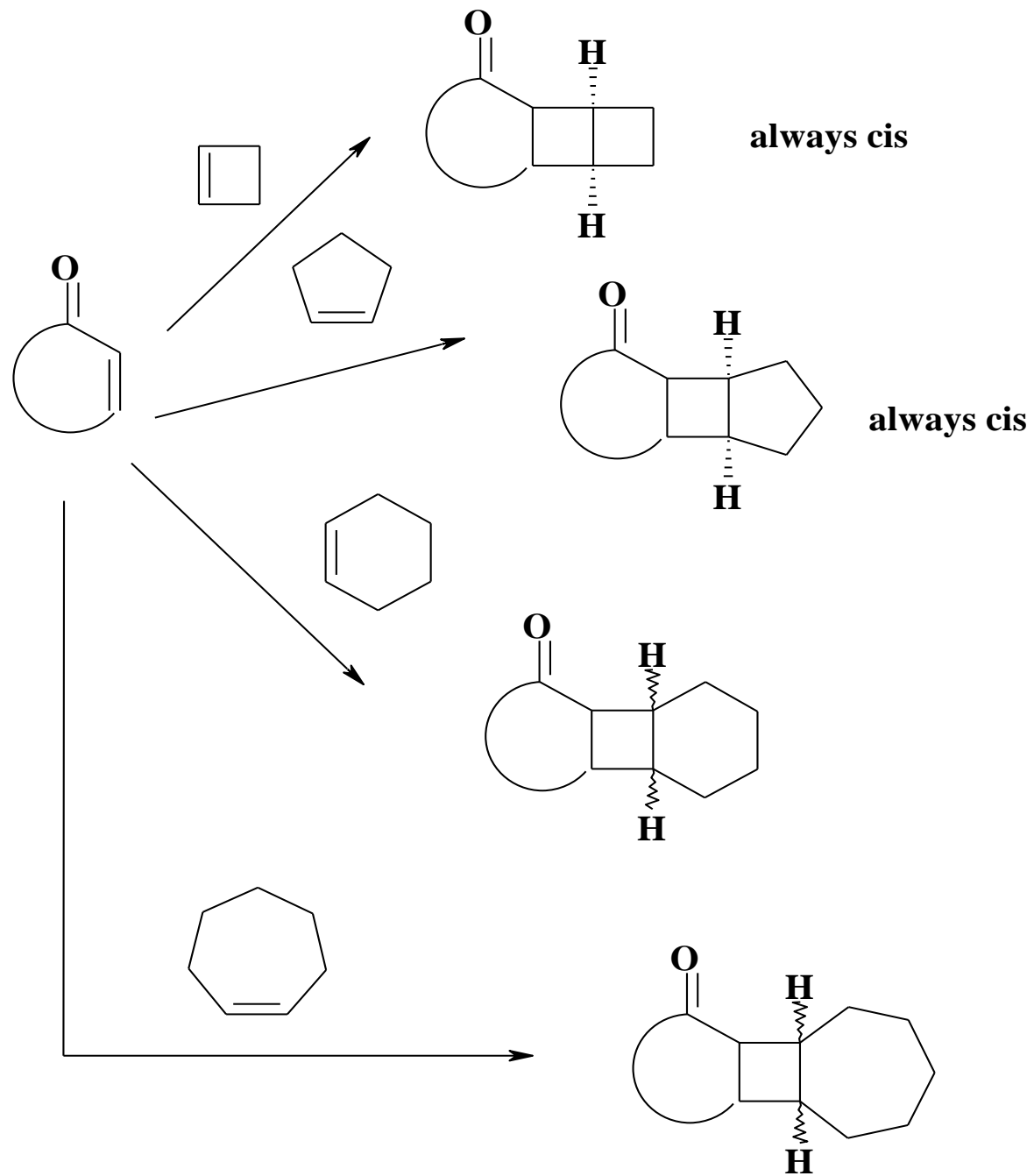


rigid cyclohexenones
(presence of heteroatoms,
fused ring)

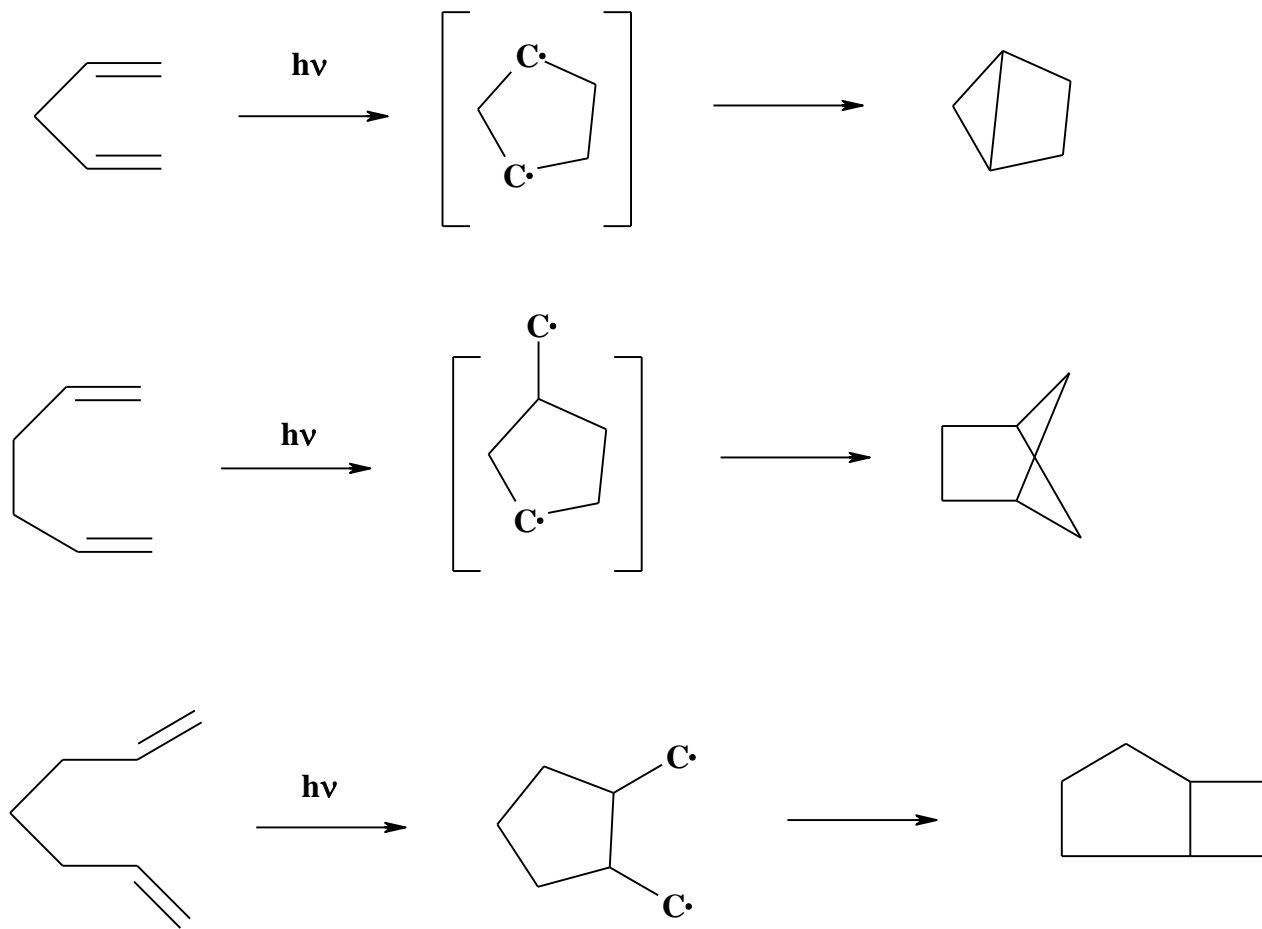
always cis ring fusion



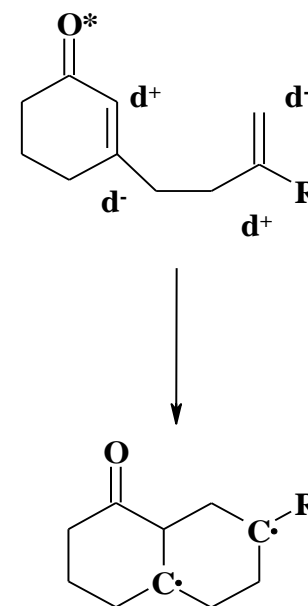
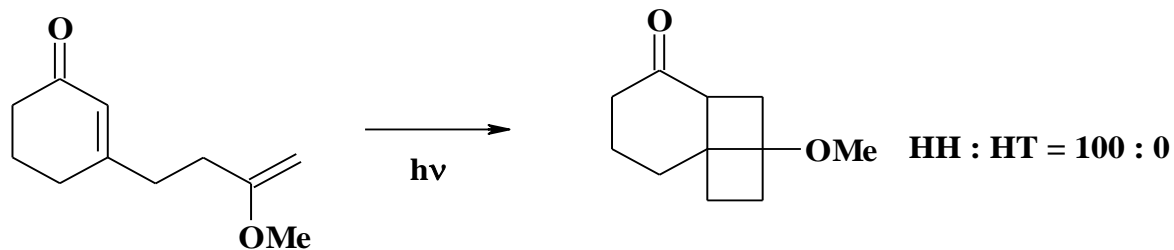
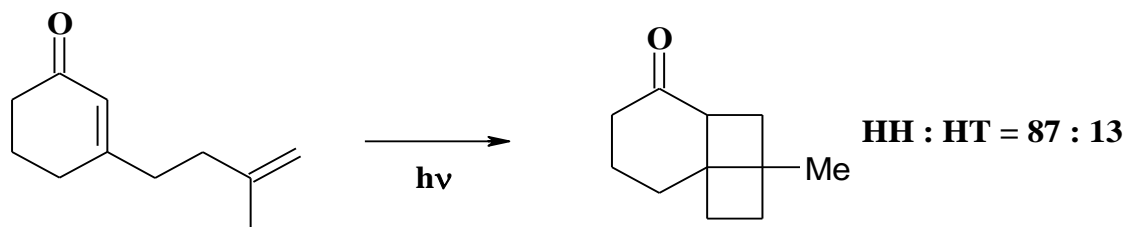
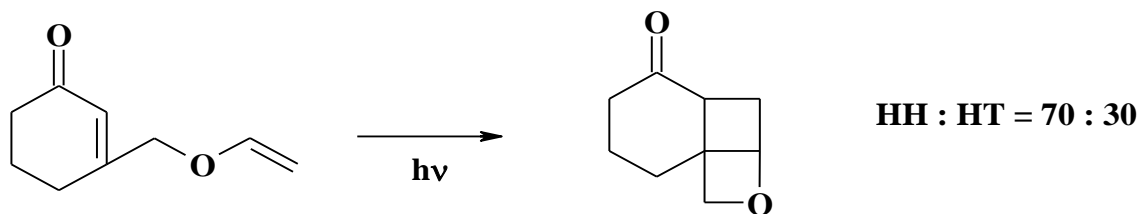
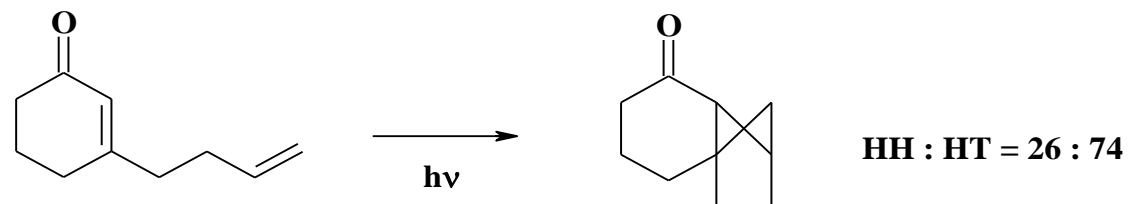
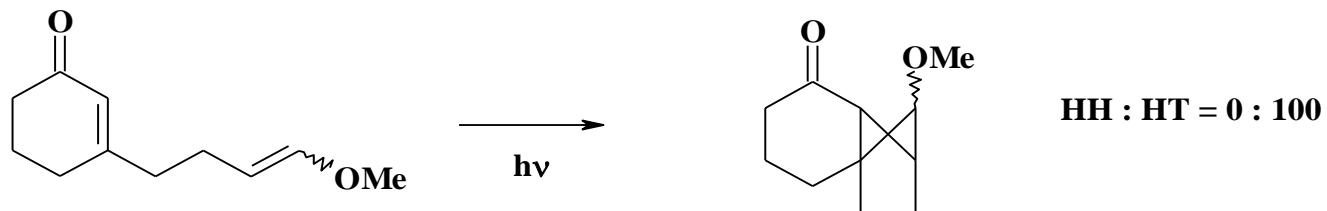
always cis fused ring junction



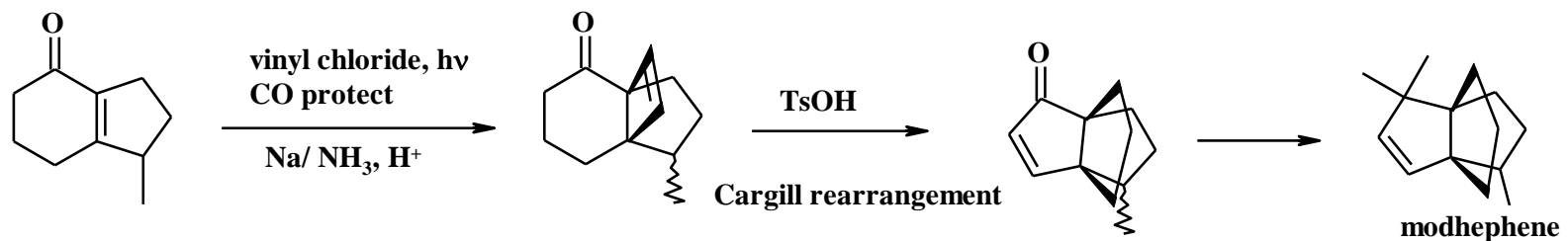
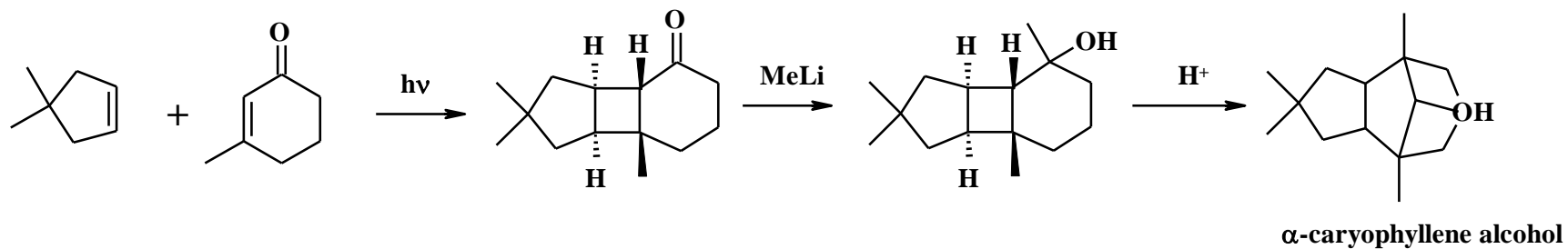
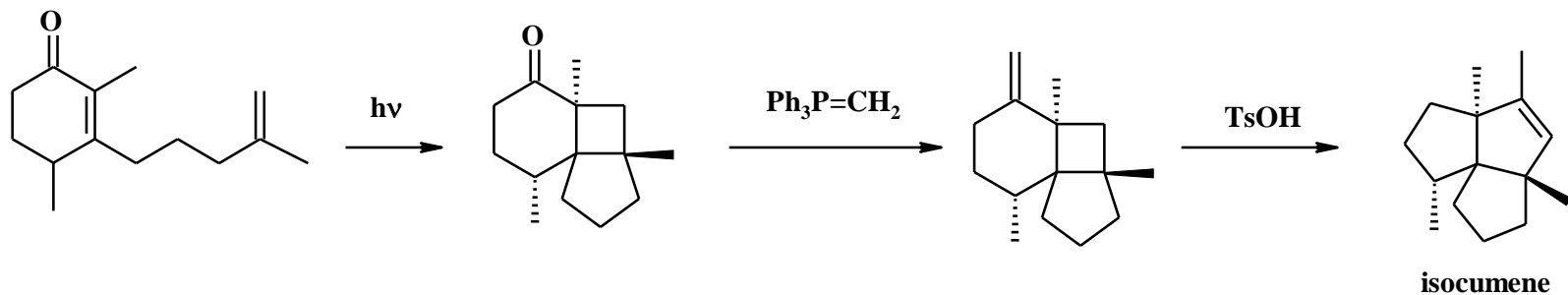
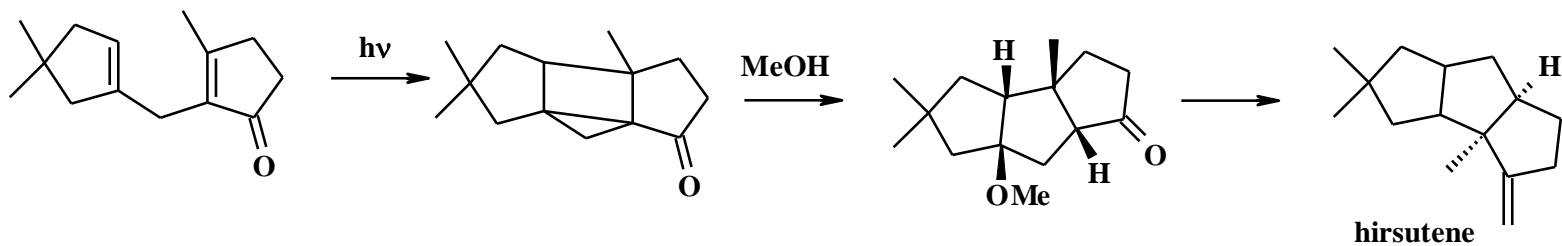
Regiochemistry of the intramolecular [2+2] photocycloaddition of 1,4; 1,5 and 1,6 dienes "Rule of FIVE"



Intramolecular enone cycloadditions



enone cycloadditions in organic synthesis



Thank You



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