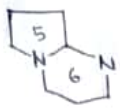
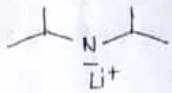
DBN (Diazo Bicyclo Noname)



DBN

DBU

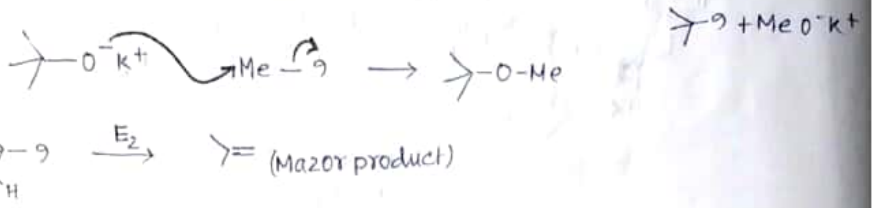


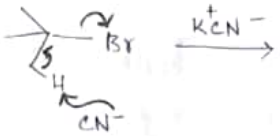
LDA

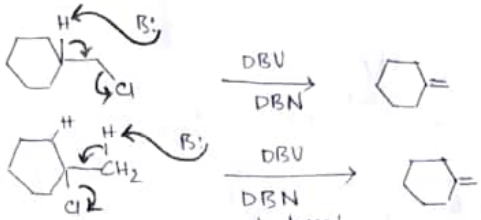
DBU (Diazo Bicyclo undacane)

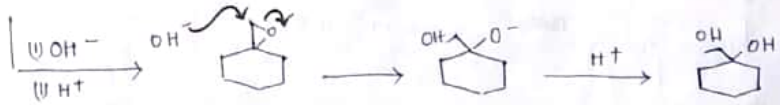
Strong organic base non nucleophilic base.

Williamson Synthesis: Ether synthesis



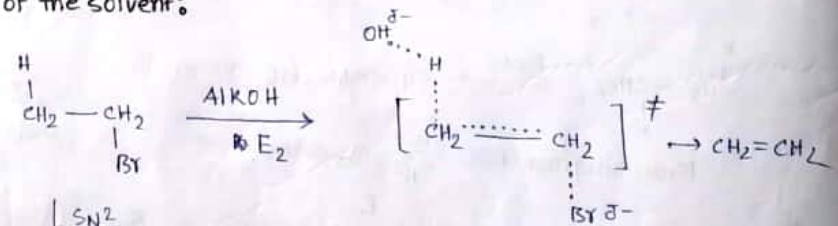


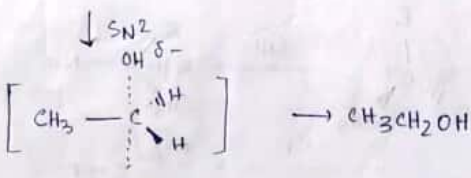




pure S_N2

Effect of the solvent:





(T.S)

Charge dispersion is greater is E_2 so it is less polar solvent al

There is less charge dispersion is S_N2 so it is more reactive in more polar solvent (aq KOH)

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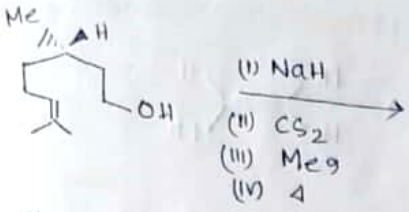
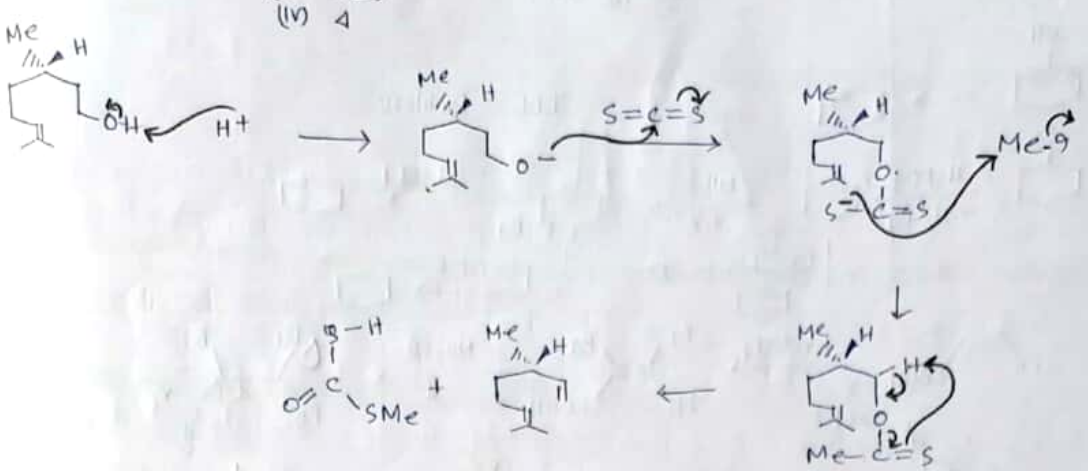
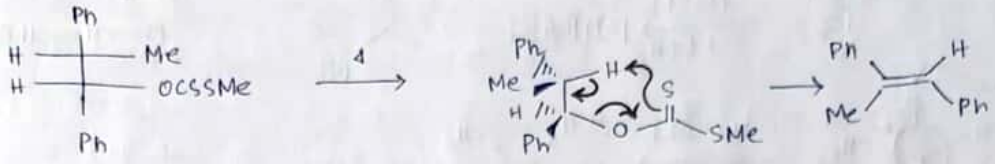
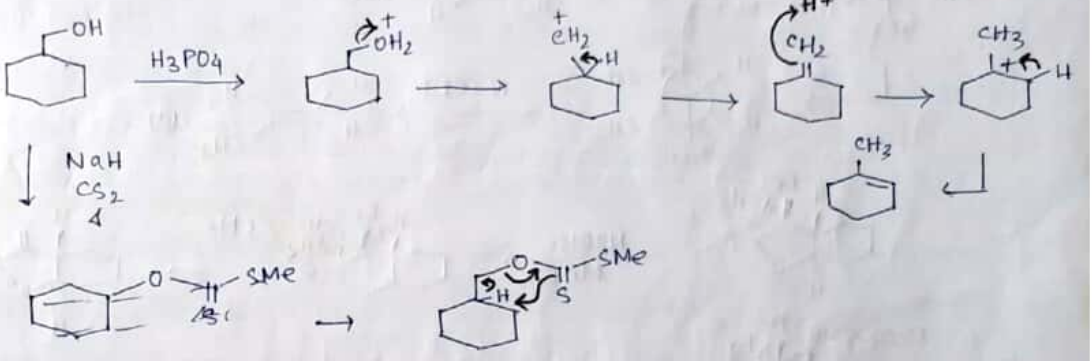




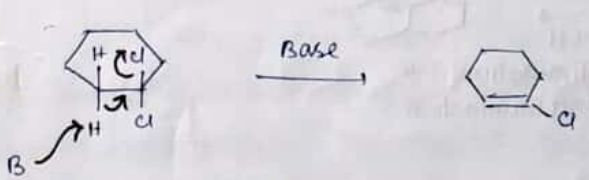
1.



2.



1.



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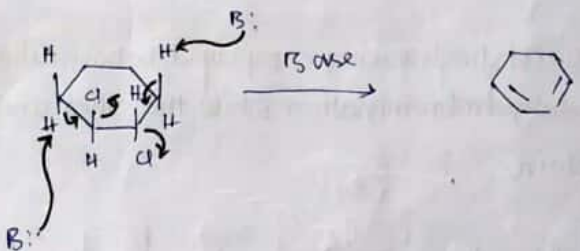

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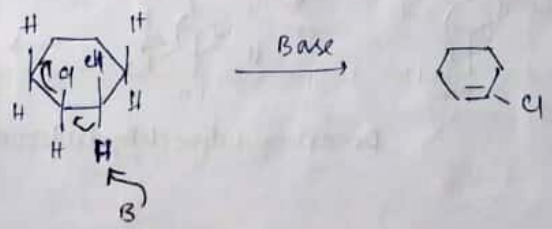

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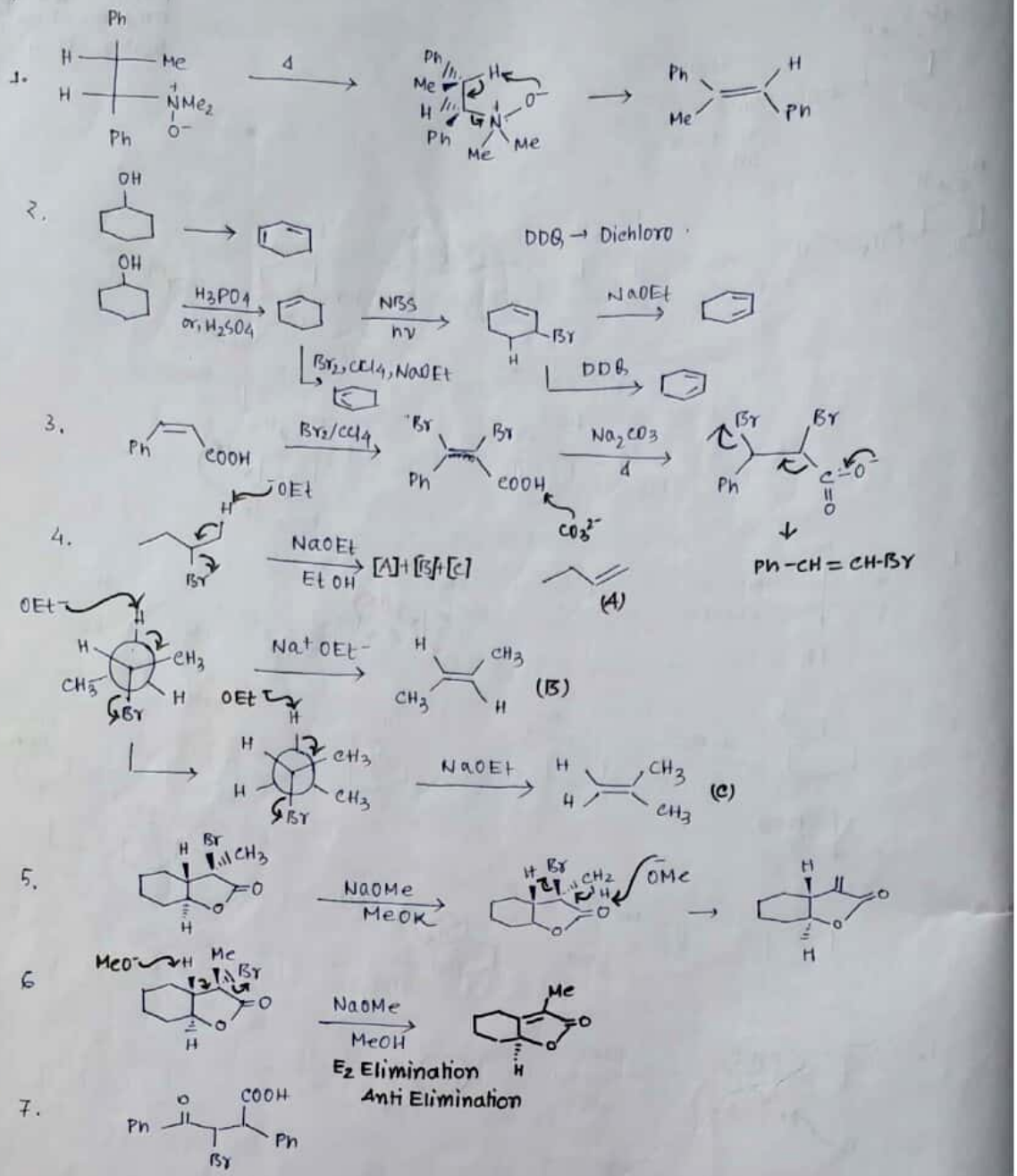
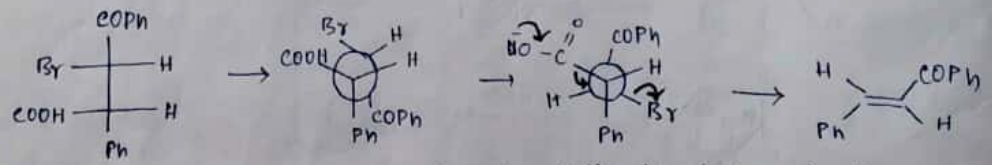
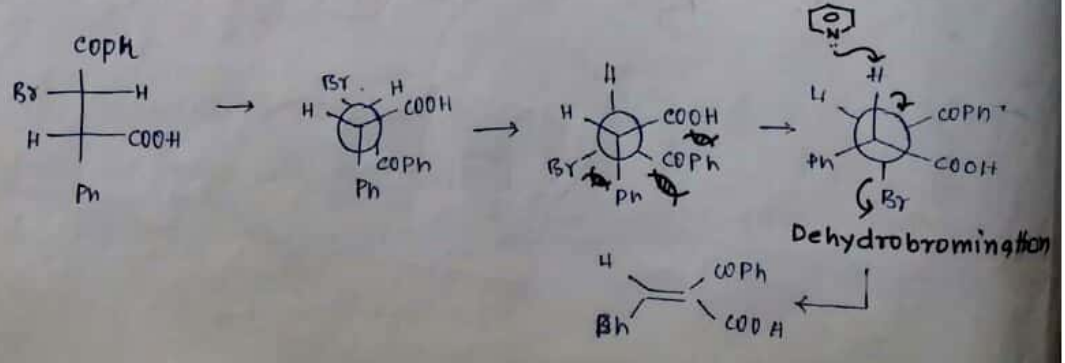


Two diastreomerof the following compound behave differently. One undergoes decarboxylative dehydrobromination while the other undergoes simple dehybromination. — Explain.



Decarboxylative dehydrobromination



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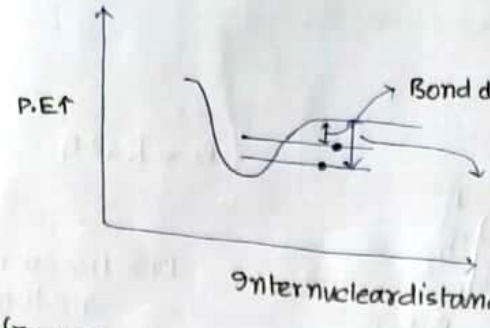
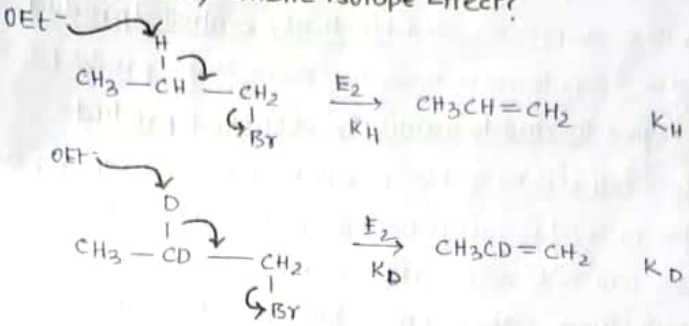
Primary kinetic isotope Effect :



Ground state vivrational energy of C-D bond is (greater) lower because reduced mass of C-D is greater than -H.

What is primary kinetic isotope Effect?

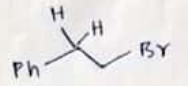


$\frac{k_H}{k_D} = 3-8$ Shows primary kinetic isotope effect.

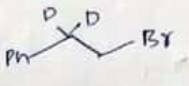
C-D bond is stronger because :

The ground state vibration energy (Op zero point vibration energy) of a bond depends on the mass of the atoms and is lower when the reduced mass is higher. That is why C-D bond is stronger than the C-H bond.

When a C-H breaking is involved in the rate determining step of a reaction a compound in which that hydrogen is replaced by it's isotope deuterium will react more slowly in the same reaction. This effect of isopic-topic substitution on the reation rate is called **primary kinetic isotope effect**.



E_2 or E_{1cB} k_H

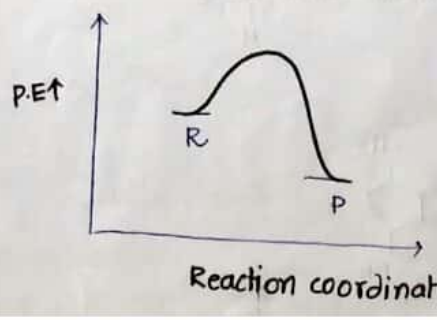


E_2 or E_{1cB} k_D

$\frac{k_H}{k_D} = (3-8)$

It shows primary kinetic isotope effect.

KCP and TCP (Kinetically controlled Product And Thermodynamically controlled product) :



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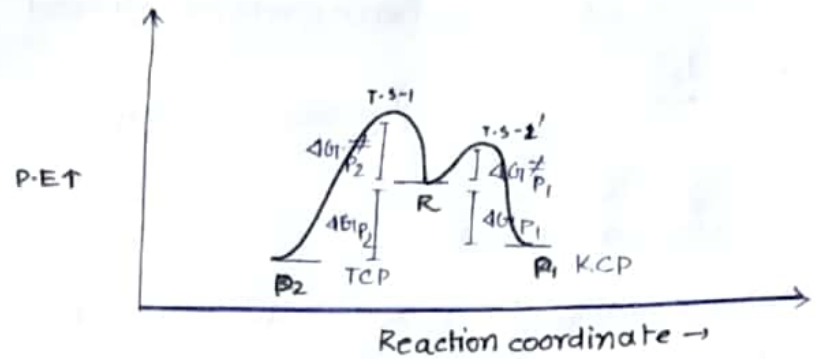
Organic Chem
Sem-2 CC-4



$P_2 \rightleftharpoons R \rightleftharpoons P_1$

ΔG_1 = free energy of the reaction

When in a reaction more than one product are formed which produced at a faster rate (lower activation energy) is called **kinetically controlled product** of the reaction is allowed to attained equilibrium then the more stable product form predominently. This is called **thermodynamically controlled product**.

If neither the reaction is reversible P_1 will be formed in larger amount. because it is form faster. The product is said to be kinetically controlled. However, if the reactions are reversible this will not necessarily be the case. If such a process is stopped well before the equillibrium has been established the reaction will be kinetically controlled. However, if the reaction is permitted to approach equilibrium the predominent product will be P_2 (Thermodynamically controlled).

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