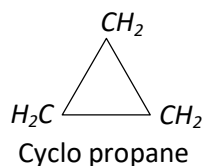


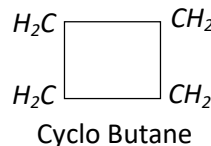
Cycloalkane.

They are carbocyclic hydrocarbons in which carbon atoms are joined by single covalent bonds to form a ring. They have general formula C_nH_{2n} .

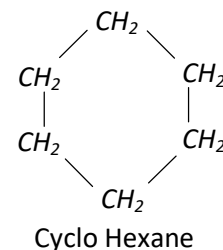
For Ex.



;

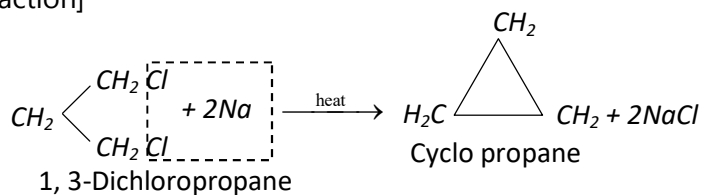


;



(1) Methods of preparation

(i) From dihalogen compounds [Freund reaction]

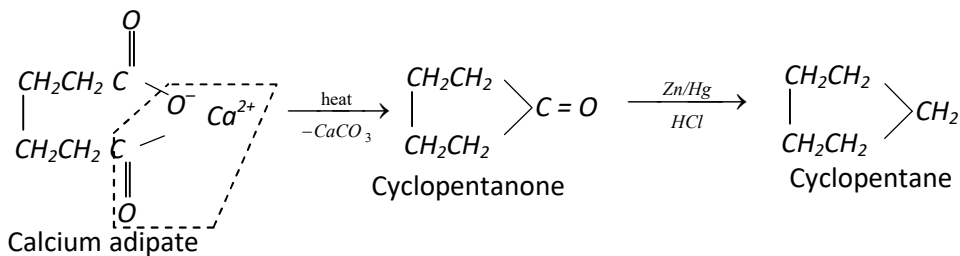


Note: It is useful in preparation of three to six membered ring.

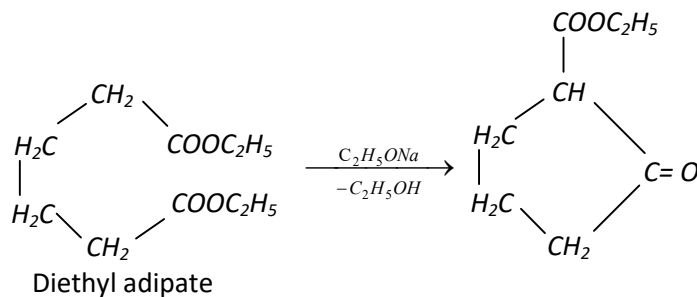
It is also known as intramolecular wurtz reaction.

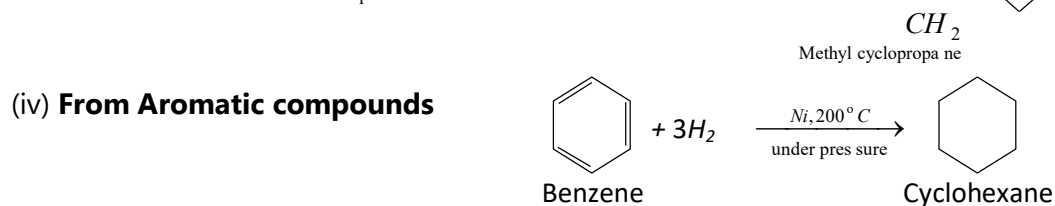
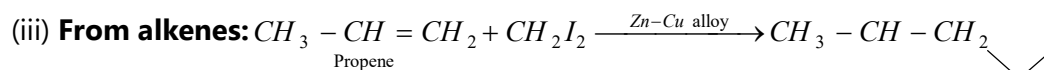
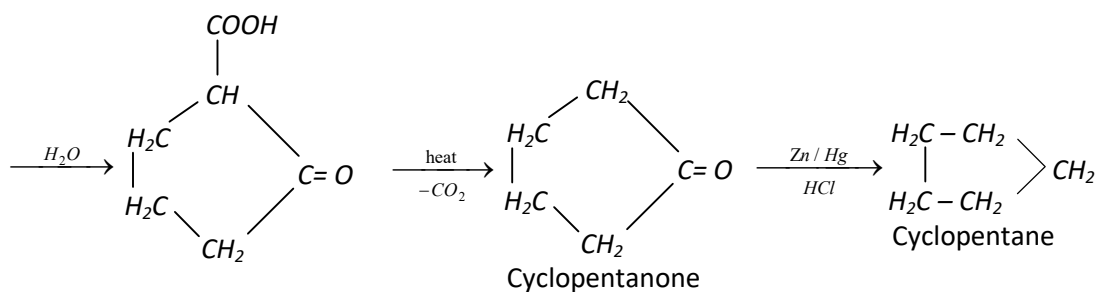
(ii) From calcium salts of dicarboxylic acids

(a) Clemmensen reduction



(b) Diekmann Cyclization





(2) Physical properties

(i) First two members are gases, next three members are liquids and higher ones are solids.

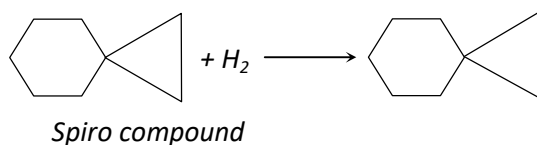
(ii) They are insoluble in water but soluble in alcohol and ether.

(iii) Their boiling points show a gradual increase with increase of molecular mass. Their boiling points are higher than those of isomeric alkenes or corresponding alkanes.

(iv) Their density increase gradually with increase of molecular mass.

(3) **Chemical properties:** Cycloalkanes behave both like alkenes and alkanes. All cycloalkanes undergo substitution reaction with halogen in the presence of light (like alkane). All cycloalkane (lower members) undergo addition reaction (ex. Addition of H_2 , HX , X_2). Further the tendency of forming addition compounds. Decreases with increase in size of ring cyclopropane > Cyclobutane > Cyclopentane. Relative ring opening of ring is explained by Baeyer strain theory.

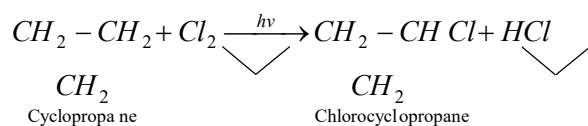
(i) **Addition in spiro cycloalkane:** If two cycloalkane fused with one another then addition take place in small ring



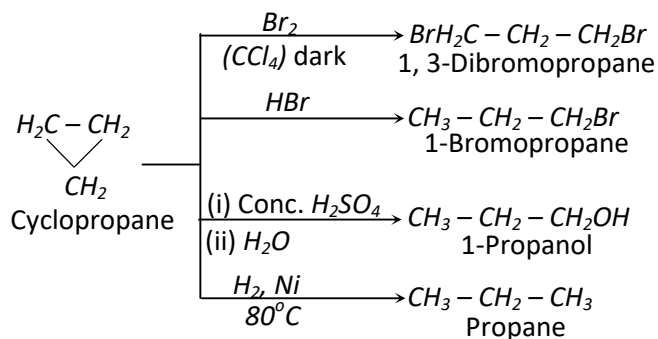
Because small ring is more unstable than large ring

Higher cycloalkanes do not give addition due to more stability.

(ii) **Free radical substitution with Cl₂**



(iii) **Addition reaction**



(iv) **Oxidation**

