

Class B.Sc Semester Ist Session 2025 to 2028

Subject — MJC I(T) Organic Chemistry

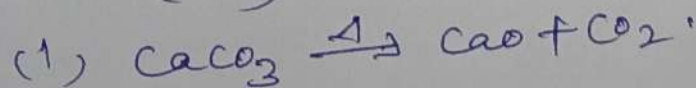
Topic Name: → Aliphatic Hydrocarbons.

Alkynes: → preparation Acetylene from CaC_2 and conversion into higher alkynes: —

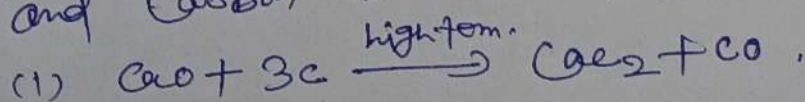
Acetylene is prepared from Calcium Carbide by reacting it with water, a process known as hydrolysis. This is achieved by first producing Calcium Carbide from quicklime and coke and then reacting the Calcium Carbide with water to produce acetylene gas and Calcium hydroxide. Higher alkynes are prepared from acetylene using alkylation reactions, where acetylene reacts with alkyl halides in the presence of a strong base, or through the dehydrohalogenation of vicinal dihalides, which are formed from alkenes.

preparation of a acetylene from Calcium Carbide: (1) produce quicklime (Calcium oxide):

Heat limestone (CaCO_3) to its decomposition temperature to obtain quicklime (CaO) and Carbon dioxide (CO_2)



(2) produce calcium carbides: — react quicklime with coke at high temperatures in an electric arc furnace to produce Calcium Carbide (CaC_2) and Carbon monoxide (CO)



(3) produce acetylene: → React Calcium Carbide with water: (H_2O) to produce acetylene C_2H_2 (P.P.O)

page ② and calcium hydroxide ($\text{Ca}(\text{OH})_2$).
This reaction is exothermic and generates acetylene gas.



Conversion to higher alkynes

Using alkylation reactions: Acetylene ($\text{HC}\equiv\text{CH}$) can be converted to higher alkynes by first deprotonating it with a strong base to form a metal acetylide. This acetylide is then reacted with an alkyl halide (R-X) to form a longer chain alkyne ($\text{R-C}\equiv\text{CH}$).

