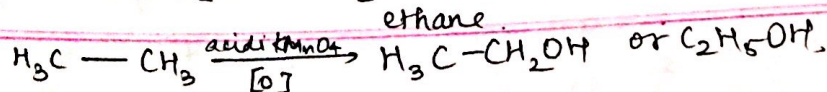
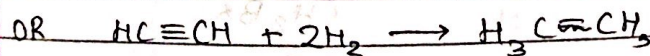
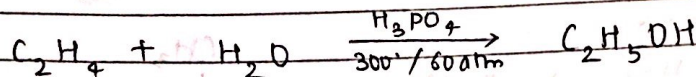
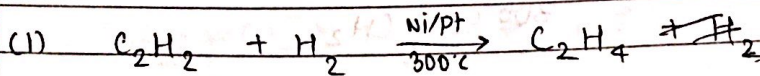


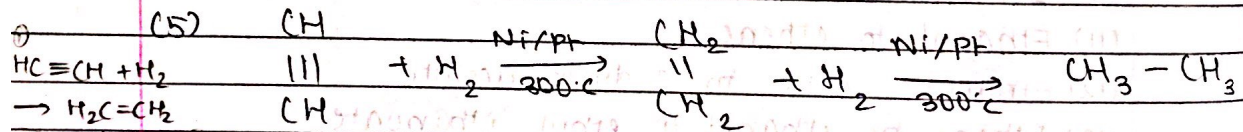
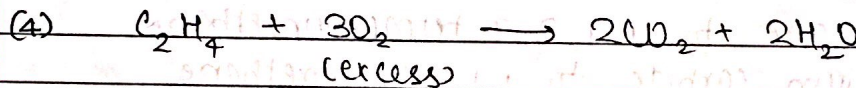
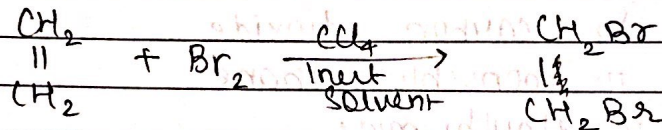
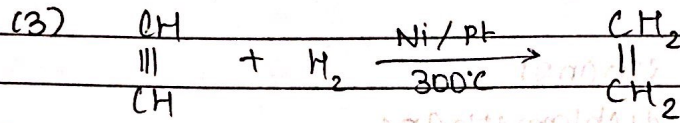
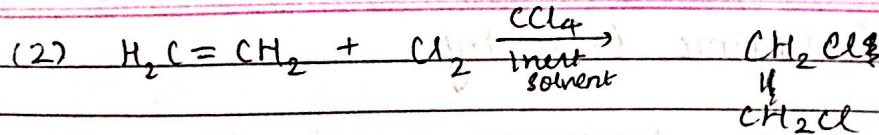
## Chp.12 - Organic Chemistry

How are the following organic conversion carried out?

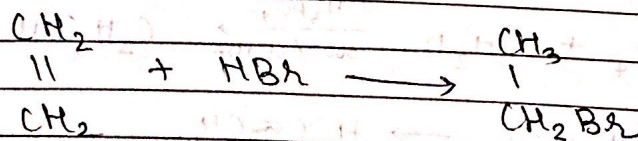
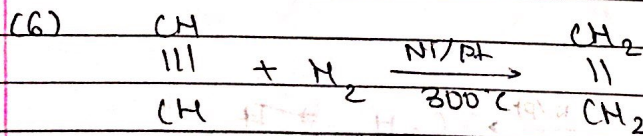
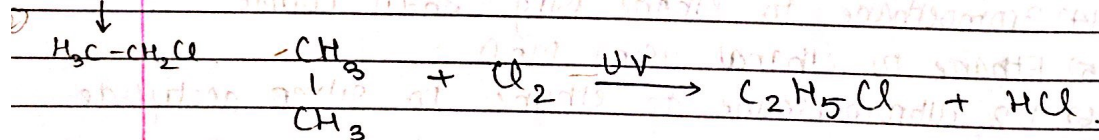
- (1) Ethyne to ethanol
- (2) Ethene to dichloromethane
- (3) Ethyne to 1,2-dibromoethane
- (4) Ethene to carbon dioxide
- (5) Ethyne to monochloroethane
- (6) Ethyne to ethylbromide
- (7) Methane to chloroform
- (8) Ethane to 1,1,2,2-tetrachloroethane
- (9) Calcium carbide to 1,1-dibromoethane
- \* (10) Ethanol to ethylene dichloride
- (11) Ethanol to ethene
- (12) Ethanoic acid to sodium acetate
- (13) Ethene to ethanol to ethyl ethanoate (ester)
- (14) Bromoethane to ethane using Zn-Cu couple
- (15) Ethane to ethanal using  $\text{MnO}_2$
- (16) 1,2-dibromoethane to ethyne to silver acetylide

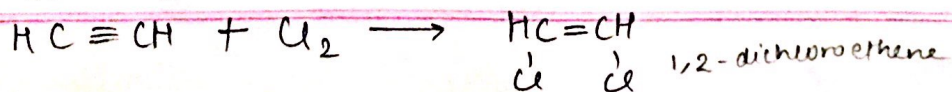
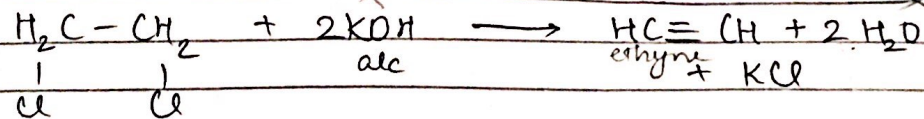
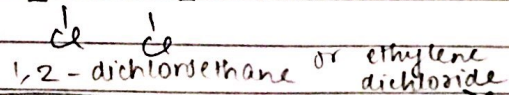
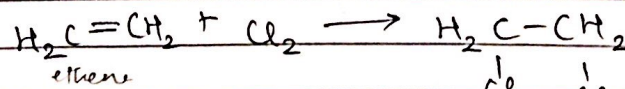
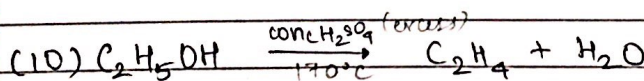
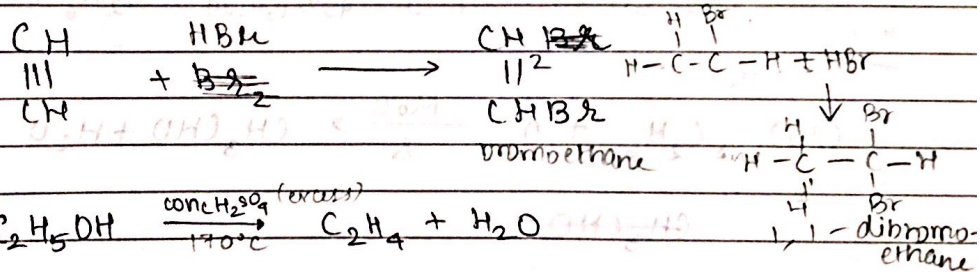
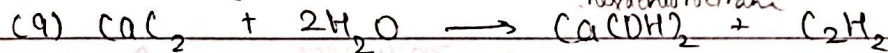
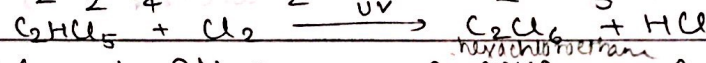
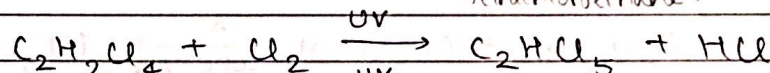
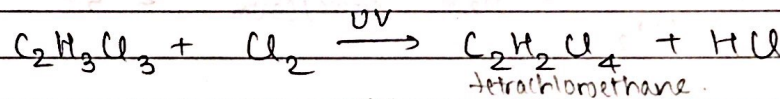
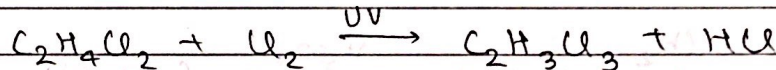
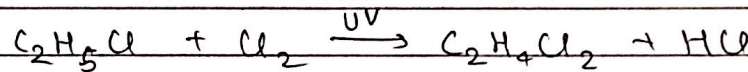
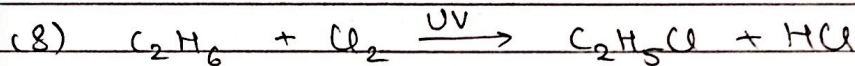
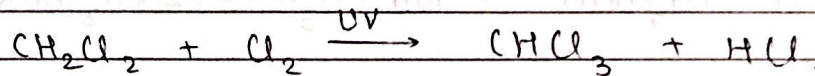
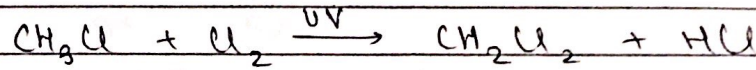
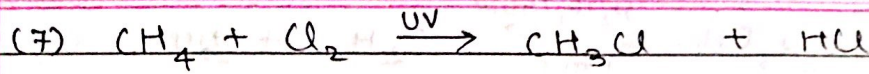
Answers:

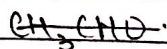
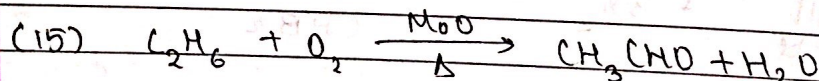
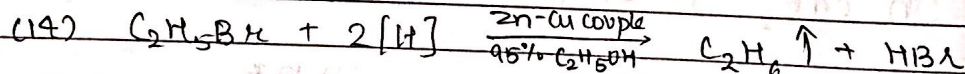
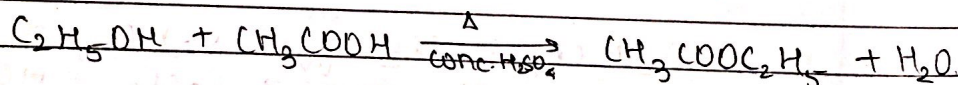
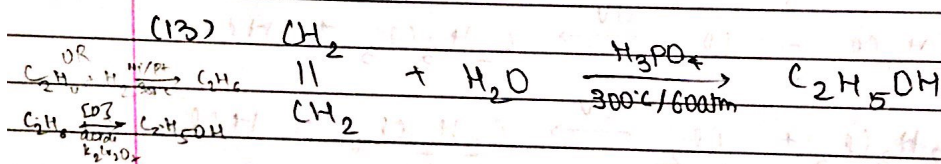
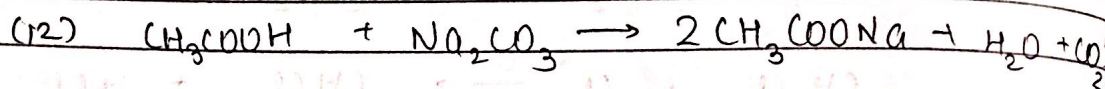
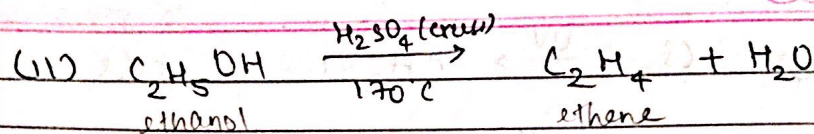


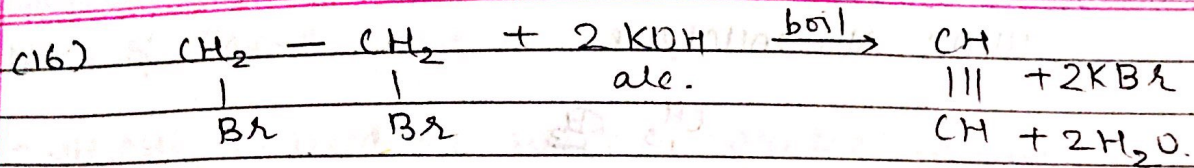


$\text{C}=\text{CH}_2 + \text{HCl}$  OR

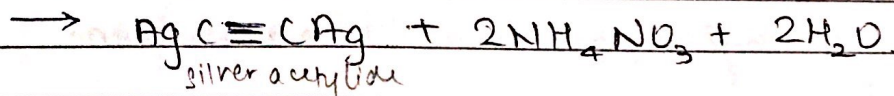
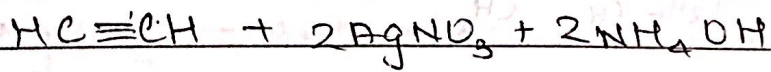






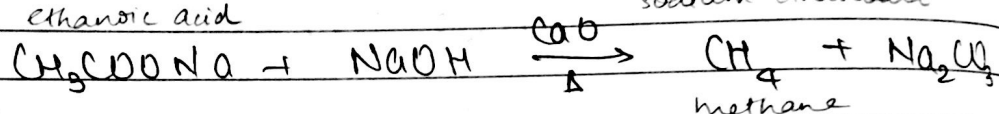
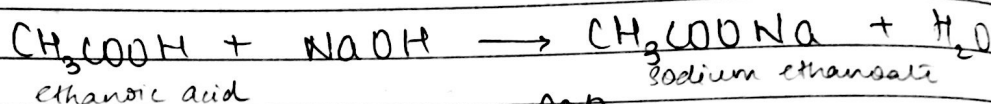
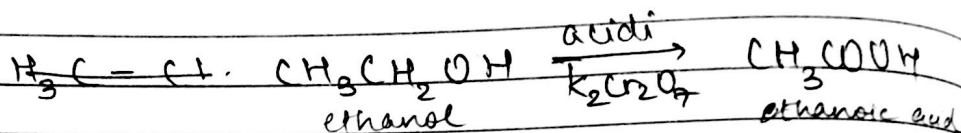


1,2-dibromoethane

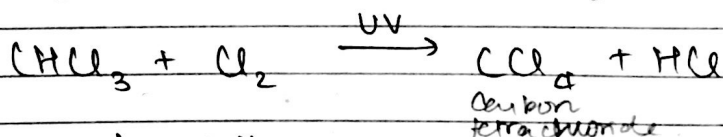
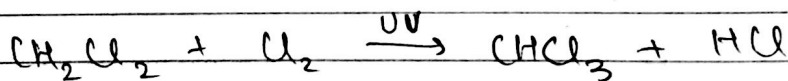
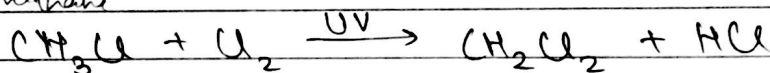
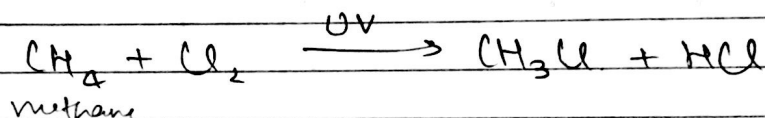




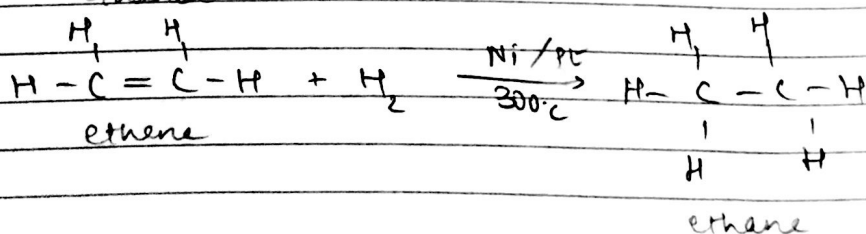
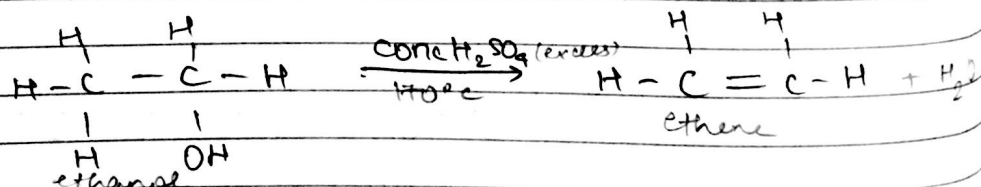
→ Ethanol to Methane



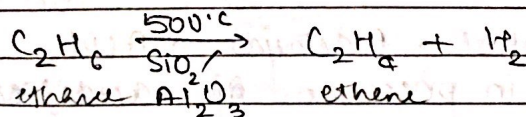
→ Methane to Carbon Tetrachloride



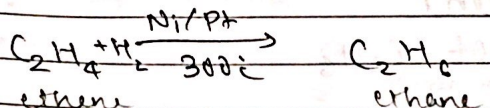
→ Ethanol to Ethane



→ Ethane to Ethene

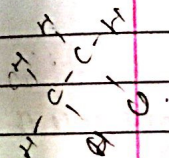


→ Ethene to Ethane



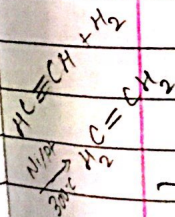
\* Points to Note

→ To increase/convert a single bond to a double bond and a double bond to a triple bond, use



DEHYDROHALOGENATION  
Removing H<sub>2</sub> +  
 (Introducing halogen and using alc. KOH)

→ To convert a triple bond to a double bond / single bond, use



HYDROGENATION  
 (addition of hydrogen in the presence of Ni catalyst)

→ Alcohol is a non-electrolyte.

→ Except ethanoic acid ( $\text{CH}_3\text{COOH}$ ) and formic acid ( $\text{HCOOH}$ ), all are non-electrolytes in organic chemistry.

∴  $\text{NH}_4\text{Cl}$  - strong electrolyte  
 $\text{NH}_4\text{OH}$  - weak electrolyte.



\* Alkane Conversions.

↳ Alkane → Alcohol → Aldehyde → Acid

→ Add  $O_2$  in presence of acidified  $KMnO_4$  or  $K_2Cr_2O_7$

↳ Alkane → Alkene

→ Pyrolysis of  $C_2H_6$  w/  $Al_2O_3$  at  $500^\circ C$

$$C_2H_6 \xrightarrow[Al_2O_3]{500^\circ C} C_2H_4 + H_2 \uparrow$$

↳ Alkene → Alkane

→ Add  $H_2$  to  $C_2H_4$  w/  $Ni/Pt$  at  $300^\circ C$

$$C_2H_4 + H_2 \xrightarrow[300^\circ C]{Ni/Pt} C_2H_6$$

↳ Alkyne → Alkene → Alkane

→ Add  $H_2$  to  $C_2H_2$  in presence of  $Ni/Pt$  at  $300^\circ C$

↳ Alkene → Alcohol

→ Add  $H_2O$  to  $C_2H_4$  (hydration) in presence of  $H_3PO_4$  at  $300^\circ C - 60 atm$ .

$$C_2H_4 + H_2O \xrightarrow[300^\circ C - 60 atm]{H_3PO_4} C_2H_5OH$$

↳ Alcohol → Alkene

→ Add  $H_2SO_4$  (excess) at  $170^\circ C$  to  $C_2H_5OH$

$$C_2H_5OH \xrightarrow[170^\circ C]{H_2SO_4 (exc)} C_2H_4 + H_2O$$

OR  $C_2H_5OH \xrightarrow[300^\circ C]{Al_2O_3} C_2H_4 + H_2O$

↳ Alcohol → Acid

→ Add  $O_2$  w/ acid  $KMnO_4$  to  $C_2H_5OH$

→ Add  $CO$  w/  $I_2-Rh$  to  $CH_3OH$

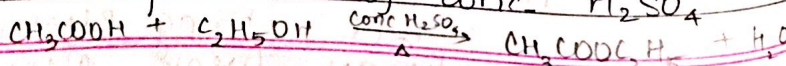
↳ Acid → Alcohol

\* → Add  $H$  in presence of  $LiAlH_4$

$$CH_3COOH + 4H \xrightarrow{LiAlH_4} C_2H_5OH + H_2O$$

↳ Acid + Alcohol → Ester (Esterification)

→ Heat in presence of conc.  $H_2SO_4$



ethyl acetate  
(ester)

↳ Alcohol & → Ether

→ Add  $H_2SO_4$  (less) at  $145^\circ C$  to  $C_2H_5OH$

$$2C_2H_5OH \xrightarrow[145^\circ C]{H_2SO_4 \text{ (less)}} C_2H_5OC_2H_5 + H_2O$$

diethyl ether

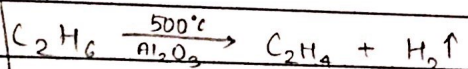
↳ Methane → Carbon

→ Pyrolysis at  $1000^\circ C$

$$CH_4 \xrightarrow[1000^\circ C]{\text{w/o air}} C + 2H_2 \uparrow$$

↳ Ethane → Carbon

→ Add v. limited  $O_2$

$$2C_2H_6 + 3O_2 \xrightarrow{\text{v. limited}} 4C + 6H_2O$$


↳ Alkane → Aldehyde

→ Add  $O_2$  w/  $MoO$  and heat w/  $C_2H_6$

