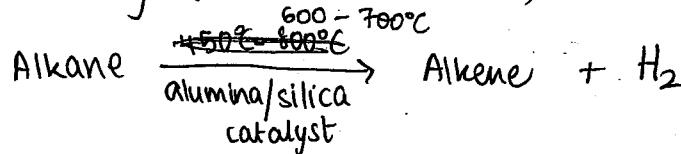
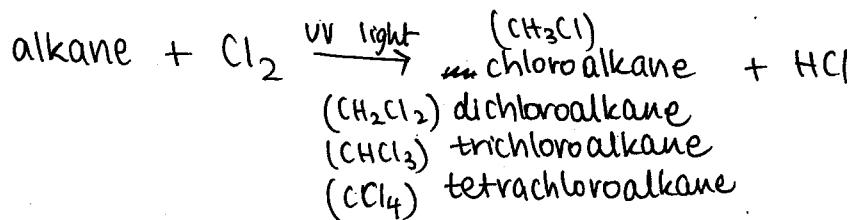


# Reactions - Cheat Sheet

## ① Cracking (Alkanes to Alkenes)

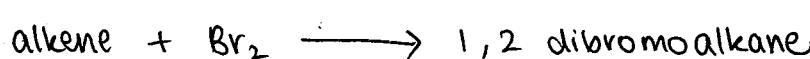


## ② Substitution Reaction

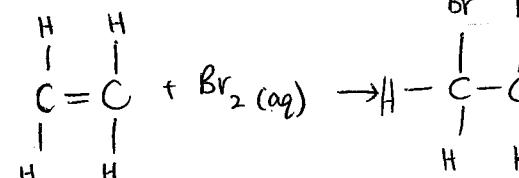


## ③ Addition Reactions (Unsaturated $\rightarrow$ Saturated)

### (i) Bromination (Test for unsaturation)



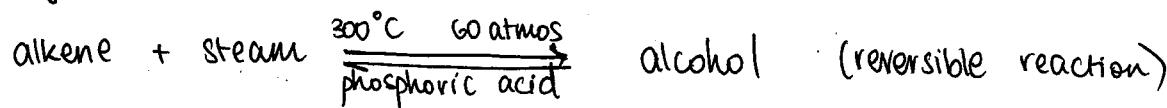
orange  $\longrightarrow$  colourless



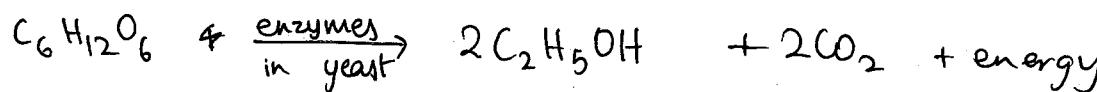
### (ii) Hydrogenation



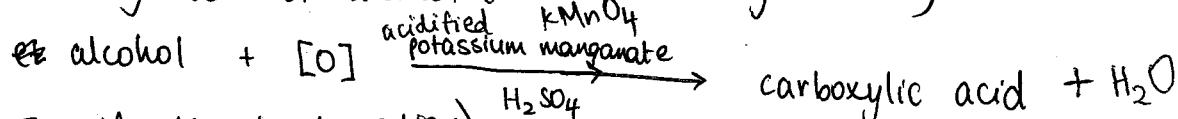
### (iii) Hydration



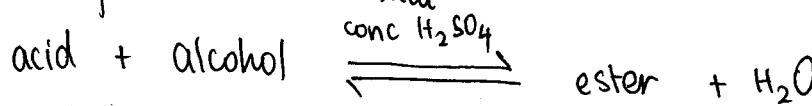
## ④ Fermentation



## ⑤ Oxidising ~~ethanol~~ alcohol (to get carboxylic acid)



## ⑥ Esterification (condensation)



\* alcohol 1<sup>st</sup> in name, 2<sup>nd</sup> from  
\* H from acid, OH from alcohol  
\* from alcohol

## Stoichiometry

$$\text{moles} = \frac{\text{mass}}{\text{Mr}}$$

$$\text{Vol} = \text{mol} \times 24 \text{ dm}^3 (24000 \text{ cm}^3)$$

$$\text{conc} = \frac{\text{mol}}{\text{Vol}}$$

$$\% \text{ purity} : \frac{\text{pure}}{\text{impure}} \times 100$$

$$\% \text{ yield} : \frac{\text{actual mass}}{\text{calculated mass}} \times 100$$

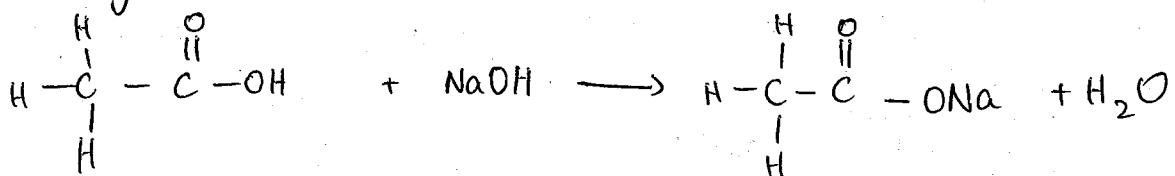
Alkanes  $C_n H_{2n+2}$

Alkenes  $C_n H_{2n}$

Alcohols  $C_n H_{2n+1} OH$

Carboxylic Acids  $C_n H_{2n+1} COOH / C_n H_{2n} O_2$

Carboxylic Acid Reaction



ethanoic acid + sodium hydroxide  $\longrightarrow$  sodium ethanoate + water

Polymers

Monomer  $\longrightarrow$  Polymer

glucose

$\longrightarrow$  starch

glucose

$\longrightarrow$  cellulose

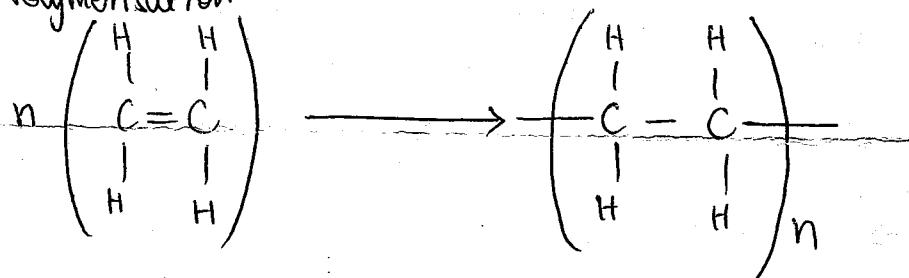
amino acids  $\longrightarrow$  proteins

chloroethene  $\longrightarrow$  poly vinyl chloride (PVC)

tetrafluoroethene  $\longrightarrow$  Teflon

phenylethene  $\longrightarrow$  poly styrene

Polymerisation



Addition Polymerisation

$\Rightarrow$  polymer is the only end product

Condensation Polymerisation

$\Rightarrow$  ~~small~~  $\rightarrow$  polymer is formed from two different monomers

$\Rightarrow$  small molecule of  $H_2O$  is often formed