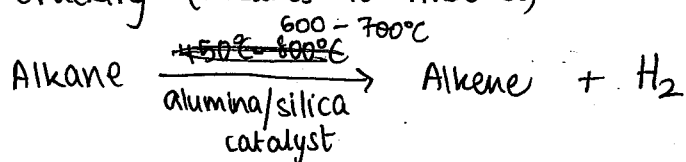
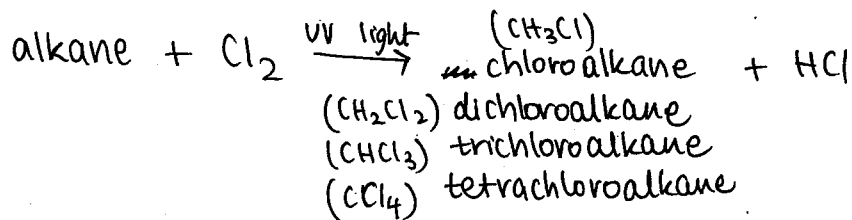


# reactions - Cheat Sheet

## ① Cracking (Alkanes to Alkenes)

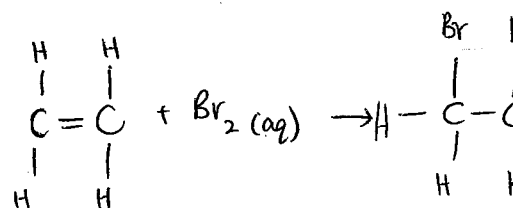
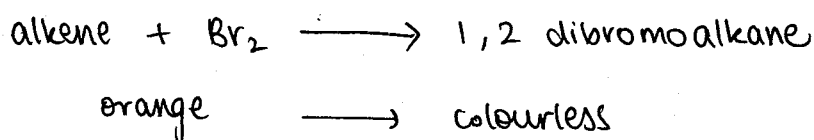


## ② Substitution Reaction



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

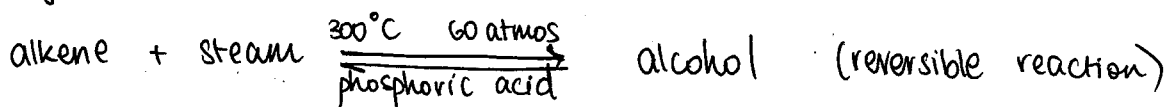
### (i) Bromination (test for unsaturation)



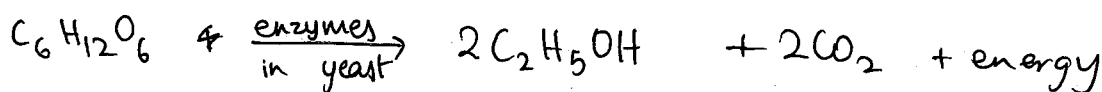
### (ii) Hydrogenation



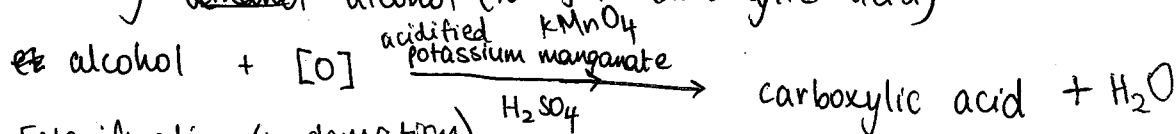
### (iii) Hydration



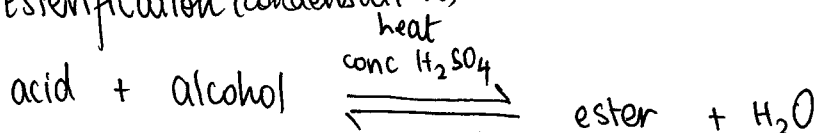
## ④ Fermentation



## 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

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

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

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

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

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

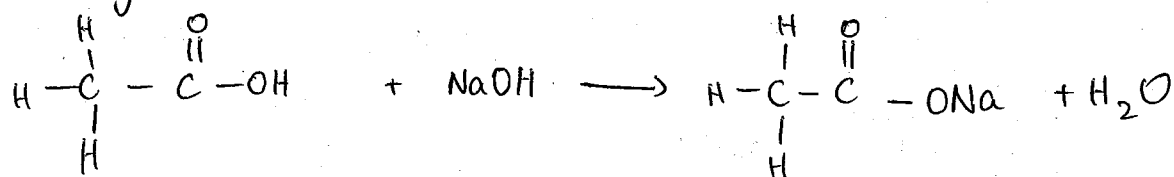
Alkanes  $C_nH_{2n+2}$

Alkenes  $C_nH_{2n}$

Alcohols  $C_nH_{2n+1}OH$

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

Carboxylic Acid Reaction



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

## Polymers

Monomer  $\rightarrow$  Polymer

glucose  $\rightarrow$  starch

glucose  $\rightarrow$  cellulose

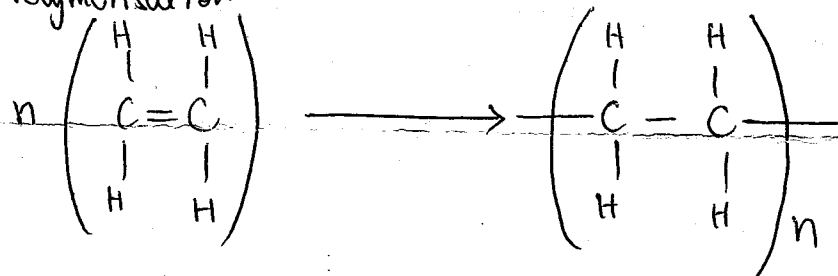
amino acids  $\rightarrow$  proteins

chloroethene  $\rightarrow$  poly vinyl chloride (PVC)

tetrafluoroethene  $\rightarrow$  Teflon

phenylethene  $\rightarrow$  polystyrene

## Polymerisation



## Addition Polymerisation

$\Rightarrow$  polymer is the only end product

## Condensation Polymerisation

$\Rightarrow$  ~~small~~ polymer is formed from two <sup>different</sup> monomers

$\Rightarrow$  small molecule of  $\text{H}_2\text{O}$  is often formed