

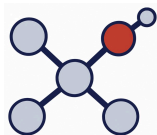
Alcohols Summary Map

Edexcel A Level Chemistry · Topic 6 Organic Chemistry I · 6E Alcohols

1 Names and classes

6A.2, 6A.4, 6E.37

- **-ol** suffix; diols keep the e
- Count C on the C-OH carbon
- 1°: 2 H, 2°: 1 H, 3°: 0 H
- $C_nH_{2n+1}OH$



2 Combustion

6E.38 i

- Complete: $CO_2 + H_2O$
- $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$
- Count the alcohol's own O
- Limited air: CO or soot



3 To halogenoalkanes

6E.38 ii

- PCl_5 : RCl, steamy HCl fumes
- Test for $-OH$ (dry)
- $KBr + 50\% H_2SO_4$: RBr
- Red P + I_2 : RI



4 To alkenes

6E.38 iv

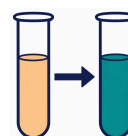
- Conc. H_3PO_4 , heat
- Water eliminated: $C=C$
- Cyclohexanol $\rightarrow$ cyclohexene
- Check every alkene and E/Z



5 Oxidation

6E.38 iii, CP5

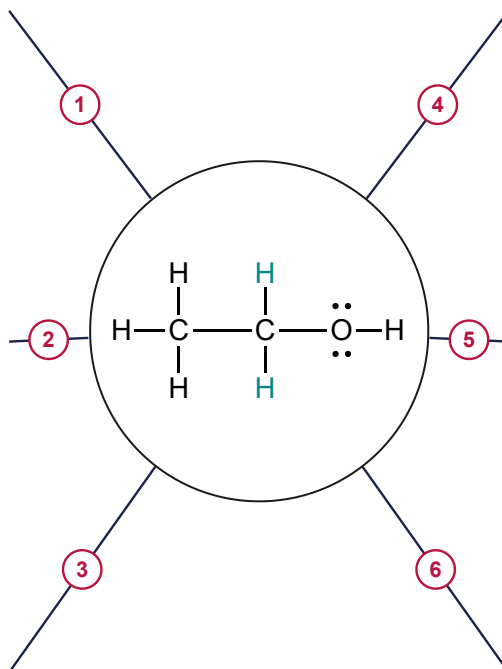
- Acidified $K_2Cr_2O_7$: orange $\rightarrow$ green
- 1° + distil: **aldehyde**
- 1° + reflux: **carboxylic acid**
- 2°: **ketone**; 3°: no reaction



6 Purifying a liquid

CP6, 6E.39

- **Reflux**: vapour returns
- **Separate**, wash with $NaHCO_3$
- **Dry**: anhydrous salt until clear
- **Distil**: sharp bp = pure



Which alcohol, which product? acidified potassium dichromate(VI); tests on the product

Alcohol	Conditions	Product	Test on the product
propan-1-ol (1°)	distil as it forms	propanal	Benedict's: brick-red
propan-1-ol (1°)	excess, reflux	propanoic acid	$NaHCO_3$: fizzes
propan-2-ol (2°)	reflux	propanone	Benedict's: stays blue
2-methylpropan-2-ol (3°)	reflux	no reaction	stays orange

Worked examples

Name and class

- $CH_3CH(OH)CH_2CH_3$
- butan-2-ol
- C-OH carbon has 2 C: **secondary**

Core Practical 6

- $(CH_3)_3COH + HCl$
- room temperature, shake
- $(CH_3)_3CCl$, upper layer

Percentage yield

- 7.4 g alcohol (Mr 74): 0.100 mol
- expect 9.25 g of RCl
- 5.6 g made: **61%**

Alcohols link halogenoalkanes and alkenes to carbonyl compounds and carboxylic acids (Topic 17); their products are identified in Topic 7.



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