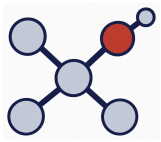
Alcohols Summary Map

OCR A Level Chemistry A · 4.2.1 Alcohols

1 Names and properties

4.2.1(a)

- **-ol** suffix; count C on the C–OH carbon
- **1°**: 2 H, **2°**: 1 H, **3°**: 0 H
- O–H: **hydrogen bonds**, high b.p.
- Small alcohols dissolve in water



2 Combustion

4.2.1(b)

- 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

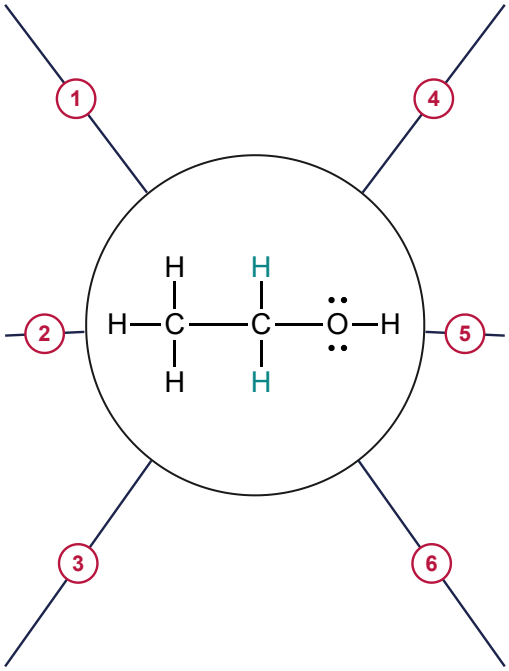


3 To haloalkanes

4.2.1(e)

- **NaBr + H_2SO_4**: HBr in the flask
- ROH + HBr → RBr + H_2O
- Heat under reflux, then distil
- Br replaces OH: **substitution**





4 To alkenes

4.2.1(d)

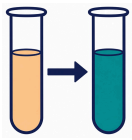
- **Conc. H_3PO_4**, heat
- Water eliminated: C=C
- Cyclohexanol → cyclohexene
- Check every alkene and E/Z



5 Oxidation

4.2.1(c), PAG 5

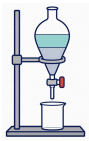
- Acidified $K_2Cr_2O_7$: orange → green
- 1° + distil: **aldehyde**
- 1° + reflux: **carboxylic acid**
- 2°: **ketone**; 3°: no reaction



6 Purifying a liquid

PAG 5, 4.2.3(a)

- **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	Tollens': silver mirror
propan-1-ol (1°)	excess, reflux	propanoic acid	$NaHCO_3$: fizzes
propan-2-ol (2°)	reflux	propanone	Tollens': no change
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**

PAG 5

- $(CH_3)_3COH + HCl$
- 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 haloalkanes (4.2.2) and alkenes (4.1.3) to aldehydes, ketones and carboxylic acids (6.1.2, A level); their products are identified in 4.2.4.

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