

Edexcel International Chemistry A Level

CP7 - The Oxidation of Propan-1-ol to Produce Propanal and Propanoic Acid

Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



What functional groups are found within propanol, propanal and propanoic acid?



What functional groups are found within propanol, propanal and propanoic acid?

Propanol - alcohol (-OH)

Propanal - aldehyde (-CHO)

Propanoic acid - carboxylic acid (-COOH)



How can propan-1-ol be converted into propanal?



How can propan-1-ol be converted into propanal?

Oxidation

Add acidified potassium dichromate to propan-1-ol and distil the product



How can propan-1-ol be converted to propanoic acid?



How can propan-1-ol be converted to propanoic acid?

Oxidation

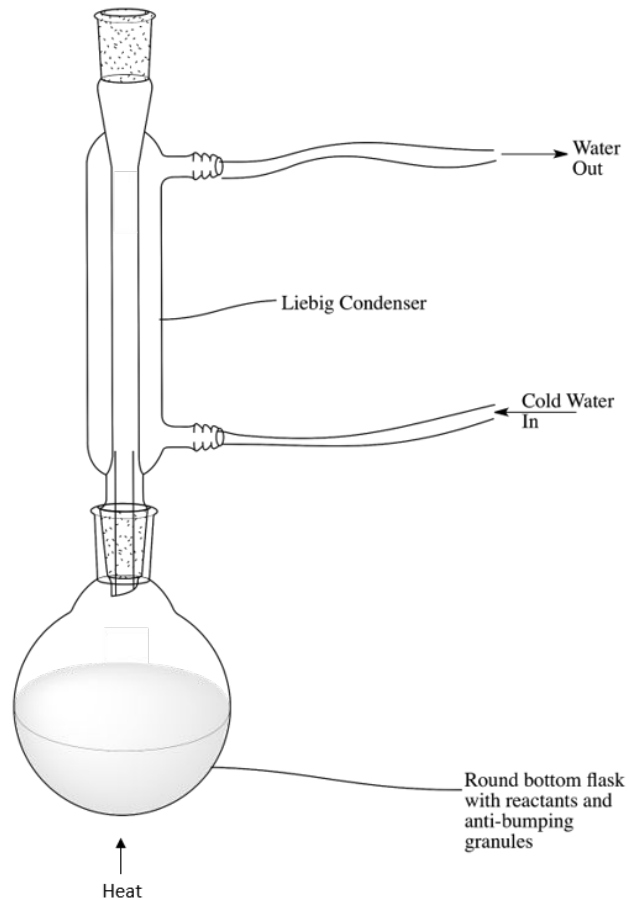
Add acidified potassium dichromate to propan-1-ol and heat under reflux



Draw and label a diagram showing the reflux set-up



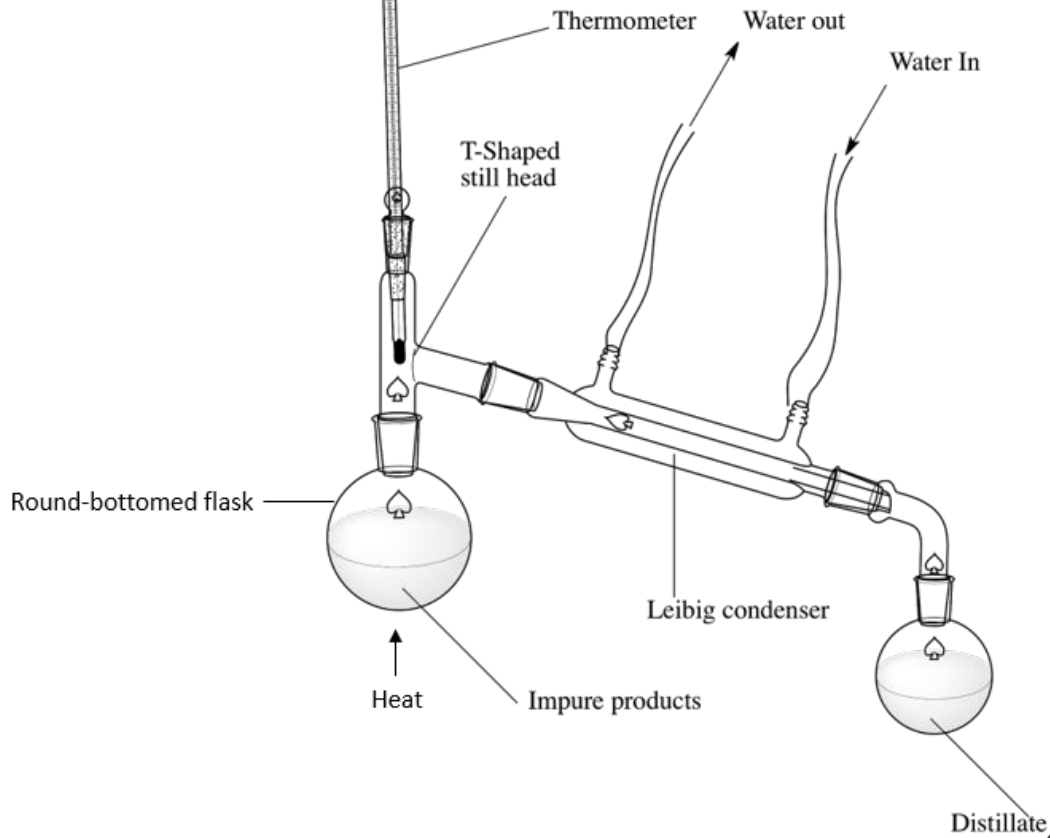
Draw and label a diagram showing the reflux set-up



Draw and label a diagram showing the distillation set-up



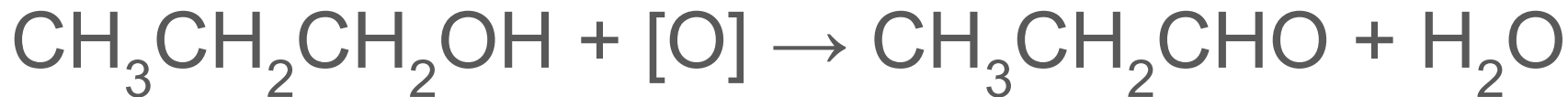
Draw and label a diagram showing the distillation set-up



Write an equation for the reaction that takes place when propan-1-ol is oxidised with acidified potassium dichromate using distillation



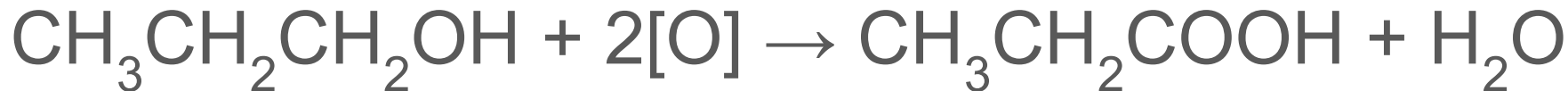
Write an equation for the reaction that takes place when propan-1-ol is oxidised with acidified potassium dichromate using distillation



Write an equation for the reaction that takes place when propan-1-ol is oxidised with acidified potassium dichromate under reflux



Write an equation for the reaction that takes place when propan-1-ol is oxidised with acidified potassium dichromate under reflux



Write an equation for the reaction that takes place when propanal is oxidised with acidified potassium dichromate under reflux



Write an equation for the reaction that takes place when propanal is oxidised with acidified potassium dichromate under reflux



What will be observed when propan-1-ol is oxidised using acidified potassium dichromate?



What will be observed when propan-1-ol is oxidised using acidified potassium dichromate?

Colour change from orange ($\text{Cr}_2\text{O}_7^{2-}$) to green (Cr^{3+})



What happens to the dichromate(VI) ions
when propan-1-ol is oxidised?



What happens to the dichromate(VI) ions when propan-1-ol is oxidised?

They are reduced to chromium(III) ions

Their oxidation state decreases from +7 to +3



What safety precautions should be taken when handling acidified potassium dichromate?



What safety precautions should be taken when handling acidified potassium dichromate?

- Wear chemical resistant gloves as it is corrosive
- Wear safety goggles
- Wash hands after use
- Avoid inhalation or swallowing as it is harmful



How can you distinguish between
propan-1-ol, propanal and propanoic
acid?



How can you distinguish between propan-1-ol, propanal and propanoic acid?

Propan-1-ol - reacts with acidified potassium dichromate causing a colour change from orange to green

Propanal - reacts with acidified potassium dichromate under reflux causing colour change from orange to green; reacts with Tollens' to form a silver mirror; reacts with Fehling's to form brick red precipitate; reacts with Brady's to form yellow-orange precipitate

Propanoic acid - pH below 7 (can be measured with a pH probe); reacts with carbonates and fizzes



Why are anti-bumping granules used in distillation and reflux?



Why are anti-bumping granules used in distillation and reflux?

Prevents the formation of large bubbles of vapour so the boiling is smoother and calmer

