

# OCR (B) Chemistry A-Level

## PAG 05a - Synthesis of an organic liquid

### Synthesis of a haloalkane

Flashcards



What type of reaction occurs when a haloalkane is formed from an alcohol?



What type of reaction occurs when a haloalkane is formed from an alcohol?

Nucleophilic substitution

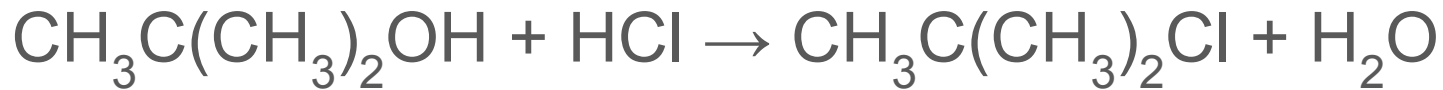


Write the word and chemical equations  
for the formation of  
2-chloro-2-methylpropane from  
2-methylpropan-2-ol



Write the word and chemical equations for the formation of 2-chloro-2-methylpropane from 2-methylpropan-2-ol

2-methylpropan-2-ol + hydrochloric acid  $\rightarrow$  2-chloro-2-methylpropane + water



What are the 3 main stages in the synthesis of a haloalkane from an alcohol?



What are the 3 main stages in the synthesis of a haloalkane from an alcohol?

1. Preparation
2. Separation
3. Distillation



Why do 2 layers form in the separating funnel when synthesising a haloalkane from an alcohol?



Why do 2 layers form in the separating funnel when synthesising a haloalkane from an alcohol?

The aqueous and organic layers have different densities and they are immiscible



What is the purpose of anti-bumping granules?



## What is the purpose of anti-bumping granules?

To prevent the formation of large gas bubbles that cause violent boiling.

During distillation, anti-bumping granules prevents the mixture boiling over into the condenser meaning impurities won't contaminating the product.



When producing a haloalkane from an alcohol, why is sodium hydrogen carbonate added to the organic layer after it has been separated from the aqueous layer?



When producing a haloalkane from an alcohol, why is sodium hydrogen carbonate added to the organic layer after it has been separated from the aqueous layer?

To react with any leftover hydrochloric acid



Why is it important to open the stopper of the separating funnel regularly?



Why is it important to open the stopper of the separating funnel regularly?

To release the build up of pressure and reduce the risk of apparatus breaking



When producing a haloalkane from an alcohol, why is anhydrous sodium sulfate added to the organic mixture after separation?



When producing a haloalkane from an alcohol, why is anhydrous sodium sulfate added to the organic mixture after separation?

To remove water (small amounts only) - acts as a drying agent



Why is distillation used when synthesising a haloalkane from an alcohol?



Why is distillation used when synthesising a haloalkane from an alcohol?

To separate and purify the organic product



Describe the key features of the apparatus set-up for distillation



# Describe the key features of the apparatus set-up for distillation

- Tilt the condenser down so any liquids flow into the beaker
- The water must enter at the bottom of the condenser and leave at the top for efficient cooling
- The collection flask should not be sealed to the condenser - it should not be airtight as the hot air in the system could cause the apparatus to crack
- Use a thermometer to identify when the desired product has evaporated from the reaction mixture



Why might a water bath or electric heater be used instead of a Bunsen burner to heat a reaction mixture?



Why might a water bath or electric heater be used instead of a Bunsen burner to heat a reaction mixture?

If the reactants are flammable as using a Bunsen burner would be a safety risk



What safety precautions should be taken when carrying out this practical?



## What safety precautions should be taken when carrying out this practical?

- 2-methylpropan-2-ol is highly flammable and harmful if inhaled. Keep away from naked flames and keep the lab well ventilated.
- Concentrated sulfuric acid causes severe skin burns and eye damage. Use a fume cupboard and wear safety goggles and gloves.
- Take care when heating apparatus. Move hot apparatus with tongs to avoid burns.

