Distillation of a carbonated drink

Transcript

Separating a mixture of liquids is the perfect job for distillation.

In this experiment a carbonated drink is going to be distilled.

First the ice baths are prepared. These act as the condensers. There should be no ice inside the test-tubes.

To one of the flasks 50 centimetres cubed of limewater is added.

Limewater can be easily disturbed and can become cloudy really easily.

About 100 centimetres cubed of the carbonated drink is added to the conical flask.

A stopper and thermometer are added and secured tightly.

To stop the gases escaping, the tubing is also securely fastened. The free end of the tube is placed into the limewater solution.

Now the hot plate is turned on and the carbonated drink is heated.

Bubbles should start to appear coming from the tube into the limewater solution. The solution becomes cloudy.

Now the temperature is measured and the time recorded.

The gas being produced is carbon dioxide. The temperature at which it is given off from the solution was 30 °C.

The carbon dioxide reacts with the limewater, calcium hydroxide, to produce calcium carbonate as a solid, which is why the solution becomes cloudy.

Using limewater is a good way to test for carbon dioxide.

The solution should be heated for a further three minutes at the same temperature.

Now the water baths are quickly swapped. The test-tube in the second ice-bath is empty.

The heat is now increased so that the temperature rises steadily.

Vapours will start to come out of the solution and to test for these a wafting test is performed.

The vapours are wafted towards the scientist. The vapours are hot and should not be directly inhaled.

The vapours are the flavourings that are present in the carbonated drink.

These food flavourings are esters and are low boiling point liquids.

The time and the temperature is recorded when a specific smell is identified.

The heat is increased so that the temperature rises steadily.

Between 90 and 100 °C a colourless liquid appears.

The carbonated drink is allowed to boil gently until enough of the colourless solution has been collected.

In this experiment three components from the carbonated drink have been identified: carbon dioxide, food flavourings and water.

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