Changes of the state of aggregation
Boiling and condensation

Distillation of red wine

Object of the experiment

1. Demonstrating the isolation of strong alcohol by distilling red wine

Setup

Safety note:
Alcohol is readily inflammable:
Before removing the distillation bridge, switch the gas supply of the cartridge burner off.

Apparatus

1 Distillation bridge after Claisen	665 338
1 Round-bottom flask, 250 ml, ST 19/26	664 301
1 round-bottom flask, 100 ml, ST 19/26	664 300
1 Chemical thermometer, -10…+110 °C/1 K	666 160
1 Butane gas burner	666 711
1 Butane cartridge, 190 g, set of 3	666 712ET3
1 Rubber tubing, 1 m x 7 mm diam.	307 65
2 Stand bases MF	301 21
4 Stand rods, 50 cm	301 27
3 Leybold multiclamps	301 01
2 Universal clamps, 0 …80 mm	666 555
1 Stand ring with stem, 100 mm diam.	666 573
1 Wire gauze, 120 x 120 mm	608 120
1 Beaker, Boro 3.3, 100 ml, squat	602 022
2 Watch glass dish, 60 mm diam.	664 153
2 Droppers, 7 x 150 mm, 10 pcs.	665 953
2 Rubber bulbs, 10 pcs.	665 954
1 Stopcock grease, 60 g	661 082
additionally recommended:	
1 immersion pump	388 181
1 Low-voltage power supply, 3/6/9/12 V	521 231
1 Beaker, TPX, 3000 ml	664 134

Carrying out the experiment

- Clamp the distillation flask (250 ml round-bottom flask) and the receiver (100 ml round-bottom flask) in the universal clamps.
- Fill half the distillation flask with red wine, and put the distillation bridge on the flasks.
- Start the cooling of the distillation bridge.
- Carefully warm the red wine with the burner at small flame.
- Observe what happens during the experiment.
- At a temperature of 90°C stop the distillation, and switch the gas supply of the cartridge burner off.
- Remove the distillation bridge, and collect 8 drops of the red wine left in the distillation flask and 8 drops of the distillate in a watch glass dish each.
- Burn the samples in the two watch glass dishes with a match and observe what happens.
- Test the smell of the distillate.

Observation

When the red wine is warmed, vapour rises.

Due to the cooling, the vapour condenses in the distillation bridge.

The distillate formed this way drips into the receiver.

After the distillation has been finished, the residue has retained its red colour whereas the distillate is colourless.

When the two samples are burnt with a match, the distillate catches fire whereas the residue does not show any reaction.

The smell of the distillate indicates that there is strong alcohol.

Evaluation

Substances can be separated from each other by distillation:

Red wine is a solution consisting of water, alcohol, sugar, and colorants.

At a temperature of approx. 78°C, alcohol boils first and rises as vapour.

After the vapour has been cooled in the distillation bridge, the strong alcohol, which has been separated from the water to a great extent, drips into the receiver.

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