GCSE Chemistry Required practical activity 8: Water purification

Student sheet

Required practical activity	Apparatus and techniques
Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.	AT 2, AT 3, AT 4

Distillation of salt water to produce potable water

In this investigation you will test salt water for the presence of sodium and chloride ions. After distillation, you will test the water again to check that these ions have been removed, making the water fit to drink.

Learning outcomes
1
2
Teachers to add these with particular reference to working scientifically

Method

You are provided with the following:

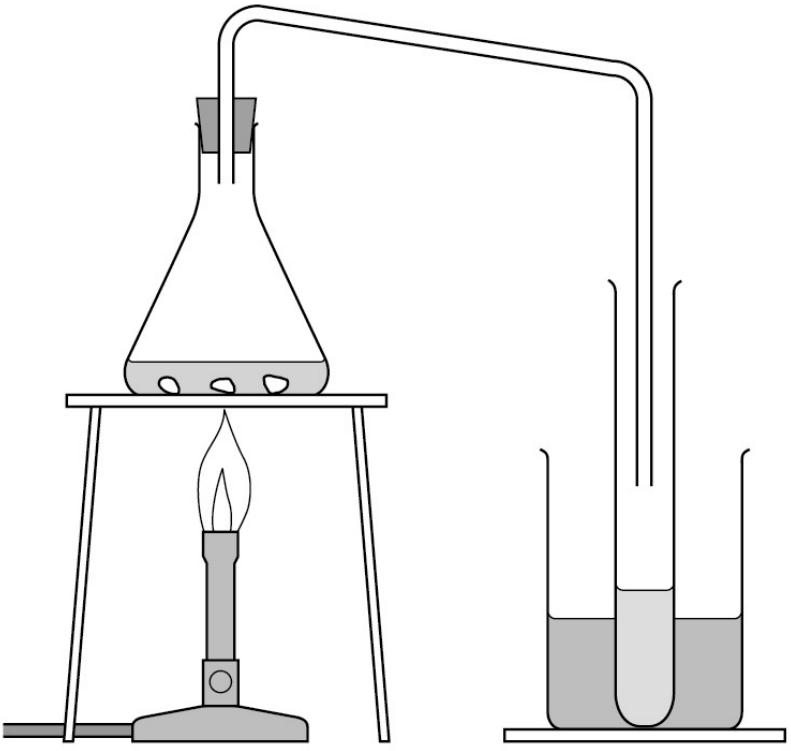
- $50cm^3$ salt water.
- Bunsen burner, tripod, gauze, heatproof mat.
- $250cm^3$ beaker, clamp stand, $250cm^3$ conical flask, delivery tube with bung, test tube, ice.
- An additional test tube, test tube rack, nichrome wire, dilute nitric acid, silver nitrate solution.

Risk assessment

Safety goggles must be worn throughout.

You should read these instructions carefully before you start work.

1. Pour around 1cm depth of the salt water into the test tube in the rack. Dip the nichrome wire into this solution, and then hold the tip of the wire in a blue Bunsen burner flame. Record your observation in the table on the back of this sheet.
2. Now add a few drops of dilute nitric acid to this solution, followed by 1cm depth of silver nitrate solution. Again, record your observations in the table.
3. Place the remaining salt water in the conical flask and set up the apparatus for distillation as shown in the diagram. Make sure the conical flask is held on the tripod and gauze using the clamp stand. Place a mixture of ice and water in the beaker surrounding the test tube.
4. Heat the water with the Bunsen burner until it starts to boil. Then reduce the heat so that the water boils gently. Distilled water will collect in the cooled test tube. Collect about 1cm depth of water in this way, then stop heating.
5. Repeat the tests in steps 1 and 2 again using the distilled water, making sure that the nichrome wire and test tube have been cleaned. Again, record your results in the table.



	Flame test	Nitric acid and silver nitrate
Salt water		
Distilled water		

A yellow flame test confirms the presence of sodium ions. A white precipitate with nitric acid and sliver nitrate solution confirms the presence of chloride ions.