

The effect of dissolved salt on the boiling point of water

Aims

To measure the approximate boiling point of water, and to find out if dissolving sodium chloride (salt) in the water affects its boiling point.



Eye protection
must be worn

Apparatus

Goggles

Bench mat

Boiling tube

Cut bung and thermometer

Distilled water

Micro burner

Retort stand and clamp

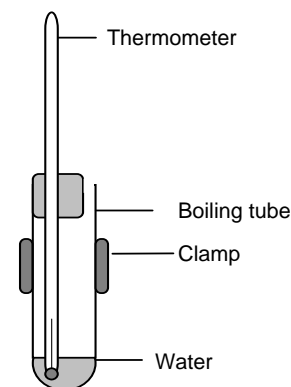
Spatula

Stirring rod

Sodium chloride

Methods

1. Add about 5cm³ of water to the boiling tube, and carefully put the cut bung and thermometer into the neck of the boiling tube. Securely clamp the boiling tube, and place the whole assembly on the bench mat (see diagram on the right).
2. Check that the bulb of the thermometer is completely surrounded by water. Gently heat the bottom of the boiling tube, using the micro burner, until the water just begins to boil. Record the maximum steady temperature obtained.



Take care not to boil the water too vigorously.

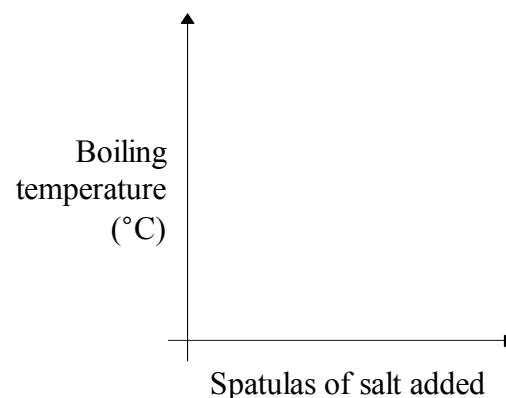
Do not allow the thermometer bulb to become uncovered.

3. Remove the micro burner, and allow the water to cool for a few minutes. Remove the bung and thermometer (**take care - it may be hot**). Add one level spatula full of salt and stir carefully with the stirring rod to dissolve the salt. Reassemble the apparatus, and repeat step 2.
4. Repeat step 3 until you have added five spatulas of salt in total.

Results

Draw up a suitable table for your results.

Plot a graph of boiling point (°C) against number of spatulas of salt added (see example axes on the right).



Conclusions

1. Describe your graph in as much detail as you can. Can you see any pattern or trend in your results?
2. Use your graph to estimate the boiling temperature when 10 and then 20 spatulas of salt have been added. Would there be any problems trying to test your answers experimentally?

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Technician's Notes

Per class:

Access to distilled water
Solid sodium chloride (put out in a labelled beaker to avoid stock contamination)
Container for used boiling tubes
Wooden spills

Per pair:

2 x safety goggles
1 x bench mat
1 x micro Bunsen burner and tubing
1 x boiling tube (Pyrex)
1 x cut bung with centre hole for thermometer
1 x thermometer (to at least 110°C)
1 x retort stand, boss and cork-lined clamp
1 x spatula
1 x stirring rod

1 x or
2 x worksheet N-ks4-19

2 x sheet of graph paper (A4 cut in two)

Health and Safety Notes:

The chemicals present little hazard, but there is a risk of hot equipment being left by pupils - care!

Please ensure that all the bungs have a large enough slit to allow steam to be vented during the experiment.