

Foaming Colour Change Potions

Red Cabbage Indicator - Experimenting with Acids and Alkalis

Equipment (Get this ready before you start)

For the indicator

A red cabbage

A saucepan

A bottle to put the indicator in (or a jug)

A ladle

For the potions

Small clear pots/jars arranged on a tray (or place spillages can easily be cleaned)

Vinegar

Bicarbonate of soda and spoon

Water

Other couple of other household liquids (e.g. soap, lemon juice, shampoo)

pH indicator scale (attached)

Method

- 1) To make your red cabbage indicator chop up half a red cabbage, pop it in your saucepan and add a good amount of water (this will become your indicator).
- 2) Gently heat the red cabbage on the hob until the water has gone purple. (**Alternatively**, you can place the chopped cabbage in a heatproof bowl and tip boiling water over, then leave it for half an hour.)
- 3) Turn off the heat and use a ladle to get the water out of the pan (try and avoid the cabbage) in to a jug. You could also use a sieve, but don't forget to collect the water! This is your indicator.
- 4) Leave the indicator to cool down. (You can speed this up by putting it in a clean plastic bottle with a lid then placing in a bowl of cold water)
- 5) Once cool, add your indicator to each of the small pots you have collected and place them on a tray. Add a dash of water to dilute slightly and really see the colour.
- 6) In the first pot, add some **vinegar**. You should see the indicator turn **pink**. Look on your chart (see bottom of the next page) to see what this means.
- 7) In the second pot add some bicarbonate of soda. The indicator will go dark blue. What does this mean? Check against your chart.
- 8) For a fizzing, colour changing potion, add a good amount of vinegar to one of your other pots of indicator, give it a stir and then add a spoonful of bicarbonate of soda and watch. What is the colour change that occurs? Can you work out why this happens?
- 9) Now experiment with some other liquids you have. What colour does washing up liquid change the indicator to? What about lemon juice? Can you change your potion back to purple? How would you do it? How many different colours can you get the indicator to go? Have fun!



Safety: Only use safe household liquids and DON'T drink the potions. Take care with sharp knives and boiling water



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Spectacular Science!

The red cabbage acts as a natural indicator to identify acids and alkalis (which are a type of chemical which cancel out acids). When you add the vinegar to the indicator it goes pink - which shows us the vinegar is an acid. You can see this on your indicator chart. We measure how strong an acid or alkali is by using a pH scale which is the chart you have below. A low number is a strong acid, 7 is neutral and a high number is a strong alkali. When you add an acid to an alkali, we call it **neutralisation**. They effectively cancel each other out. Using this science, you should be able to add alkaline solutions to acidic ones or vice versa in order to neutralise them and get the indicator back to purple. Experiment and have fun!

Cut along here: - - - - -

Red Cabbage Indicator pH Scale

