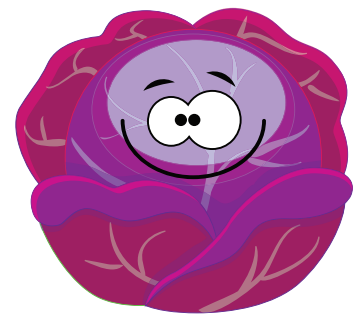


Red Cabbage pH Indicator

Acids and alkalis

Acids and alkalis can be found in many different products and places, including the acid in our stomach and some of the products your parents use to clean the house are alkaline solutions. Using a scale called pH, scientists can see how acidic or alkaline a solution is, acidic solutions have a low pH, while alkaline solutions have a high pH. Very strong acids and alkalis are very harmful to both humans and our environment, so it is important that scientists can measure pH. Being able to measure pH allows us to ensure the water we are drinking is a good quality as well as allowing us to safely store foods for longer periods.

In chromatography being able to measure and control the pH of our mobile phase allows scientists to retain and separate a mixture of different compounds.



MATERIALS

- Red cabbage
- Hot water
- Blender or knife to cut cabbage
- Fine sieve/strainer
- Large bowls
- Funnel (if available)
- 3 small clear glass jars
- Various household items to test such as orange juice, vinegar, soap, baking soda, carbonated cola drink, a normal hand soap bar (not a sensitive skin version)

INSTRUCTIONS

Step 1: Tear, chop or blend (with an adult) red cabbage leaves into small pieces.



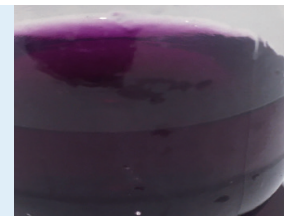
Step 2: Place the chopped-up cabbage into the bowl and pour (with an adult) the hot water over the cabbage and leave it to sit for 10 minutes, the water should turn a bright purple color.



Step 3: Transfer the contents of the bowl into an empty glass jar using a fine sieve/strainer over a funnel to strain the pieces of cabbage out. Use the sieve/strainer over a bowl if you don't have a funnel.

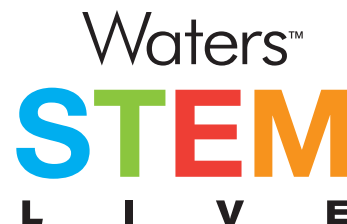


Step 4: Transfer equal amounts of the purplish-blue solution to several empty small glass jars or suitable clear glass containers.



Red Cabbage pH Indicator

Acids and alkalis



USING THE INDICATOR

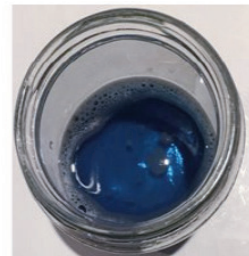
Test 1 (ACID): To the first small glass jar add several drops of vinegar until the indicator turns red.



Acid
(vinegar)



Neutral
(water)



Alkaline
(normal bar of hand soap)

Test 2 (NEUTRAL): To the second small glass jar add several drops of tap water, the indicator will remain purple.

Test 3 (BASE ALKALI): To the third small glass jar add a few shavings from the bar of soap and swirl the solution until the indicator turns dark blue.

Safety tip!

Do not carry out this experiment without adult supervision. Safety goggles and gloves are recommended when dealing with strong acids and strong alkalis. All the chemicals used in this experiment can be safely washed down the sink with plenty of running water.



HOW IT WORKS

Red cabbage contains a chemical compound called anthocyanin which will change color in different solutions. An acidic solution like vinegar creates a red color, a neutral solution like water remains a purple color and an alkali like baking soda or the bar of hand soap will give a blue/green color. The anthocyanin from the red cabbage acts as a natural pH indicator changing color depending on its environment.

www.waters.com