

Red Cabbage as a pH Indicator

Materials

- Red cabbage
- Mortar and pestle
- Ethanol (95%)
- Water
- Pasteur pipette
- Test tubes and rack



Chemicals Used



Vinegar (Acetic acid)



Caustic soda (NaOH)



Sulfuric acid (H₂SO₄)



Sodium bicarbonate
(NaHCO₃)

Procedure

- 1) Crush a red cabbage leaf in a mortar with ethanol and water to obtain an extract.
- 2) Use a pipette to pour a small amount of the extract into 5 different test tubes.
- 3) Add a different substance to each test tube:
 - one with vinegar
 - one with caustic soda
 - one with sulfuric acid
 - one with sodium bicarbonate
 - one with only cabbage extract (control)
- 4) Observe the color changes

Results and Observations

The original color of the extract is purple.

It changes depending on the pH of the added substance:

- 1) Vinegar (acidic) becomes pink
- 2) Caustic soda (strong base) becomes yellow
- 3) Sulfuric acid (strong acid) becomes red
- 4) Sodium bicarbonate (weak base) becomes dark green
- 5) Control (only cabbage) stays purple

Conclusion

Red cabbage is a natural pH indicator. Its pigment changes color depending on whether a substance is acidic or basic.