

# Creating an effervescent universal indicator 'rainbow'

## Introduction

Sodium carbonate solution is added to a burette containing a little hydrochloric acid and universal Indicator. The two solutions react, with effervescence, and the liquid in the burette shows a 'rainbow' of all the colours of universal Indicator from red through orange, yellow, green and blue to purple.

This experiment will take around five minutes.

## Equipment

### Apparatus

- Eye protection
- Burette, 50 cm<sup>3</sup>
- Retort stand with boss and clamp
- Cotton wool plug

### Chemicals

- Universal Indicator solution
- Hydrochloric acid solution, 10 cm<sup>3</sup>, 2 mol dm<sup>-3</sup>
- Sodium carbonate solution, 20 cm<sup>3</sup>, 1 mol dm<sup>-3</sup>

## Health, safety and technical notes

- Read our standard health and safety guidance here <https://rsc.li/3FmsKhU>
- Always wear eye protection
- Hydrochloric acid is low hazard (see CLEAPSS Hazcard [HC047a](#)).
- Sodium carbonate is low hazard (see CLEAPSS Hazcard [HC095a](#)).

## Procedure

1. Clamp the burette vertically.
2. Add 0.5 cm<sup>3</sup> of the Universal indicator solution followed by 10 cm<sup>3</sup> of the hydrochloric acid to give a clearly visible red colour.
3. Add 20 cm<sup>3</sup> of the sodium carbonate solution.
4. Insert a loose plug of cotton wool in the top of the burette.
5. The sodium carbonate and hydrochloric acid react, with effervescence, and the burette will be filled with liquid showing a 'rainbow' of all the colours of Universal indicator from red through orange, yellow, green and blue to purple.

## Notes

Place the burette against a white background to show the colours to best advantage.