An effervescent Universal indicator ‘rainbow’

Description

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.

Apparatus and chemicals

- Eye protection
- A 50 cm^3 burette
- A retort stand with boss and clamp
- Cotton wool plug
- A few cubic centimetres of Universal Indicator solution
- About 10 cm^3 hydrochloric acid solution (2 mol dm^{-3})
- About 20 cm^3 sodium carbonate solution (1 mol dm^{-3})

Procedure

HEALTH & SAFETY: Wear eye protection.

Your employer’s risk assessment should be consulted before carrying out this activity. This activity is covered by model (general) risk assessments widely adopted for use in UK schools such as those provided by CLEAPSS®, SSERC and ASE. Bear in mind, however, that these may need some modification to suit local conditions.

a Clamp the burette vertically. Add about 0.5 cm^3 of the Universal indicator solution followed by about 10 cm^3 of the hydrochloric acid to give a clearly visible red colour. Now add about 20 cm^3 of the sodium carbonate solution. Insert a loose plug of cotton wool in the top of the burette. 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.
b A white background will show the colours to best advantage.

Reference

This demonstration was developed in this form by Grant Birchby and Alan Matear of Blackburn College for the RSC

Credits

Health & safety checked January 2018

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