

Some reactions of carbon dioxide – teacher notes

Topic

Gases

Timing

20 minutes

Apparatus

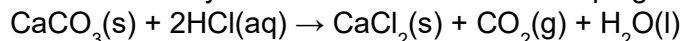
- Student information sheet and worksheet
- Clear plastic sheet (eg ohp sheet)
- Plastic petri dish (base + lid), 9 cm
- Plastic pipette
- Scissors

Chemicals

- Solutions contained in plastic pipettes, see our standard health and safety guidance here <https://rsc.li/3LNbkfo>
- Hydrochloric acid, 1 mol dm⁻³
- Barium nitrate solution, 0.2 mol dm⁻³
- Sodium hydroxide, 0.5 mol dm⁻³
- Small marble chips

Method

The action of hydrochloric acid on marble chips generates carbon dioxide:



Test results

- The barium nitrate and sodium hydroxide drops should show no change.
- The barium nitrate and sodium hydroxide mixture should turn cloudy owing to the formation of the very insoluble barium carbonate from the reaction of the (acidic) carbon dioxide gas with (alkaline) barium hydroxide.

Health, safety and technical notes

- Students must wear suitable eye protection (Splash resistant goggles to BS EN166 3).
- Hydrochloric acid, HCl(aq), 1 mol dm⁻³, is of low hazard (see CLEAPSS HazCard [HC047a](#)).
- Sodium hydroxide, NaOH, 0.5 mol dm⁻³ is corrosive (see CLEAPSS HazCard [HC091a](#)). Reducing the concentration to 0.4 mol dm⁻³ means it is an irritant with less of a requirement for goggles.
- Barium nitrate, Ba(NO₃)₂, 0.2 mol dm⁻³ (s) is a skin/eye irritant (see CLEAPSS HazCard [HC011](#)).