# Some reactions of carbon dioxide– student sheet

## 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 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

## Procedure

* You must wear eye protection.
* Cover the worksheet with a clear plastic sheet.
* Place the base of the petri dish directly over the circle below. Place the reaction vessel in the centre.
* At the corners of the triangle add drops of the test solutions as indicated below (Care: barium nitrate is toxic).
* Put a small marble chip in the reaction vessel and add three drops of hydrochloric acid. Quickly replace the lid on the petri dish.
* Record all your observations over the next 15 min.
* The action of hydrochloric acid on marble chips generates carbon dioxide: CaCO3(s) + 2HCl(aq) → CaCl2(s) + CO2(g) + H2O(l)

## Question

What explanations can you give for your observations?

## 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](https://science.cleapss.org.uk/Resource-Info/HC047a-Hydrochloric-acid.aspx)).
* Sodium hydroxide, NaOH,  0.5 mol dm–3 is corrosive (see CLEAPSS HazCard [HC091a](https://science.cleapss.org.uk/Resource-Info/HC047a-Hydrochloric-acid.aspx)). 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](https://science.cleapss.org.uk/Resource-Info/HC011-Barium-chromate-VI-nitrate-V-and-peroxide.aspx)).

![Diagram

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