

## Tests on ions

- MAGS                      Hi, we're Mags and Cal.
- CAL                        We're pretty used to doing tests at uni, but part of Chemistry is real-world testing.
- MAGS                      Like testing our drinking water, for example. Here's our video about tests for different types of ions, specifically sulfate and carbonate ions.
- Drinking water shouldn't have too much of certain substances – sulfates, for example, can give water a nasty taste or make people ill.
- This water sample is a solution which we know contains a sulfate salt. I'm going to test it to prove it contains sulfate ions.
- First, add barium chloride to your sample. If sulfate ions are present, a white precipitate of barium sulfate will form.
- CAL                        Precipitate is an insoluble solid, formed when two or more solutions are mixed.
- MAGS                      Yup. Barium sulfate is insoluble so this white precipitate appears.
- CAL                        This is stuff you need to know – including the ionic equation.
- MAGS                      Another test for ions is for carbonate ions. This is a two-step experiment using acids. For this experiment, I'm going to test for carbonate ions in a piece of limestone.
- In step one, you add an acid to your sample. A fizzy, bubbling reaction will tell us if carbonate ions are present. So here goes.
- The carbonate ions are present so a gas is produced – there it is, fizzing away.
- That's because carbonate ions react with dilute acids to produce carbon dioxide and water.
- But is the gas given off carbon dioxide?

# Bitesize

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| CAL  | Probably?  |
| MAGS | Probably's not good enough. Step two – prove it. Collect the gas and bubble it through limewater, which is calcium hydroxide solution.   |
| CAL  | Ooh, it's turning milky and cloudy.  |
| MAGS | And there's the proof that it's carbon dioxide.  |
| CAL  | <p>There are other ions that we can test for. Halide ions are tested with silver nitrate whilst metal ions are tested with the flame test.</p> <p>So, to test for sulfate ions, add barium chloride solution and look for a white precipitate.</p> |
| MAGS | <p>To test for carbonate ions, add acid and look for a fizzy reaction. Bubble the gas through limewater and if it turns milky, you know it's carbon dioxide.</p> <p>And speaking of milk, I think that's off.</p>                                  |