

The reactivity of the group 2 metals

Introduction

Students react magnesium and calcium with hydrochloric acid to find out which is the most reactive

Equipment

Apparatus

- Eye protection
- Test tube rack
- Test tube x 2
- Splint

Chemicals

- Hydrochloric acid 1 mol dm⁻³
- Magnesium
- Fresh calcium

Health, safety and technical notes

- Read our standard health and safety guidance here <https://rsc.li/3EWrfLG>
- Always wear eye protection.
- Hydrochloric acid is of low hazard, see CLEAPSS Hazcard [HC047a](#).
- Magnesium is pyrophoric and water reactive, see CLEAPSS Hazcard [HC059b](#).
- Calcium is water reactive, see CLEAPSS Hazcard [HC019c](#).

Notes

- Discussion about how to judge the speed of the reaction is advisable.
- Remind students about the test for hydrogen.
- Calcium can be distributed on pieces of filter paper.
- Group 1 is the most reactive group of metals. The Group 1 metals get more reactive the lower they are in the group. Group 2 metals are also reactive.

Answers

1. Calcium.
2. Magnesium + hydrochloric acid → magnesium chloride + hydrogen
Calcium + hydrochloric acid → calcium chloride + hydrogen
3. $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
 $\text{Ca} + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2$