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. $Mg + 2HCl \rightarrow MgCl_2 + H_2$
   $Ca + 2HCl \rightarrow CaCl_2 + H_2$

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