**Metal reactivity**

**(This sheet accompanies the video experiment)**

**Aim:** To compare the reactivity of a series of metals.

**Background**

You are now aware that there are many different metals.

Does it matter which one you use for a particular task?

Will some metals last longer than others?

**Method**

You are supplied with samples of:

iron calcium copper sodium

potassium zinc magnesium lead

**Step 1**: Add each metal to water. Use the table provided to record if a reaction occurs and the degree of reactivity.

The reactions are shown on video.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| iron | calcium | copper | sodium | potassium | zinc | magnesium | lead |
|  |  |  |  |  |  |  |  |

1. When potassium is added to water, a gas was evolved.

a. What is this gas likely to be? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. How could you test the gas? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. The other product is potassium hydroxide. Write a balanced equation for the reaction

occurring.

PAUSE

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2. The video shows the reactions of rubidium and caesium.

a. What trend is evident in the reactivity of the Group 1 metals?

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b. Why does this trend exist?

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**Step 2**: Adding metals to 2.0 M HCl (See video)

The metals that did not react in water are now added to 2 M HCl.

3. Which metals can you now add to your reactivity table?

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**Step 3**: Adding stronger acid (See video)

4. What does the stronger acid tell you? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. List all metals tested in order of reactivity, from most to least. (Include caesium and rubidium)

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6. How does the reactivity of metals link to their position on the periodic table?

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7. Give some examples of how the reactivity of metals is linked to where particular metals are

used. Example: sodium is not used for water spouting on houses.

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**Step 4**: Other comparisons of metal activity. (See video)

8. Which of these two reactions occurs?

zinc + copper sulfate solution 🡪

*complete the equation for the one that reacts*

copper + zinc sulfate solution 🡪

9. How could you use the reactivity table of metals you made to deduce which reactions in Q.8

will occur?

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10. For each of these combinations, state if a reaction will occur. If it does, complete the equation

for the reaction.

Na + CaCl2 🡪

Mg + KI 🡪

Ca + MgBr2 🡪

Mg + CaBr2 🡪

Cu + FeCl2  🡪