Worksheet 1

Name Class Date

|  |
| --- |
| **Your teacher may watch to see if you can:**   * carry out an experiment appropriately * use apparatus accurately and safely. |

Aim

Sulfur **impurities** in hydrocarbon fuels cause the release of sulfur dioxide. This gas dissolves in water in the clouds, and is oxidised to form dilute sulfuric acid, which falls as **acid rain**:

H2O(l)  SO2(g)  ½O2(g) → H2SO4(aq)

You are going to investigate the effect of dilute sulfuric acid on some building materials.

Method

|  |  |
| --- | --- |
| Apparatus   * eye protection * test tube * test-tube rack * dropping pipette * small samples of building materials * dilute sulfuric acid (0.5 M) * sieve and bowl for waste materials | Z:\03_Production_CSC\03_Art\06_IG_HTML\CHEMISTRY\Output\01_Worksheet\Lesson 79\Warning_icon.png Safety  Wear eye protection.  Dilute sulfuric acid is irritant.  Take care not to jam the samples in the test tube.  Make sure you dispose of solids as directed by your teacher and not into the sink. |

**1** Put a small sample of a building material into the test tube.

**2** Add dilute sulfuric acid until the test tube is about one-third full.

**3** Observe and record what happens over the next 2 minutes, then wash out your test tube as directed by your teacher.

**4** Repeat steps **1**–**3** with other building materials.

Recording your results

Record your results in a suitable table, like this one.

|  |  |  |
| --- | --- | --- |
| Building material | Typical use | Observations |
| aluminium | window frames |  |
| copper | pipes, roofs |  |
| steel | nails, screws, girders |  |
| zinc | roofs |  |
| brick | walls |  |
| concrete | walls |  |
| limestone | walls |  |
| marble | walls |  |

Considering your results

**1** Identify the substances that had visible reactions with dilute sulfuric acid in your experiment.

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**2** Explain why each reaction given in question 1 might cause problems for buildings exposed to acid rain.

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Evaluation

**3** Evaluate this investigation as a model for acid rain damage. Discuss its advantages and disadvantages compared with carrying out observations on buildings outdoors, and reach a conclusion.

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