

## Chemical Reactions, Acids & Alkalis

### Core Homework 1

#### Signs of a Chemical Reaction

1. For each of the following, say whether a chemical reaction or a physical change is taking place.
  - a. Cutting your hair.
  - b. Mixing baking soda with vinegar to produce a gas.
  - c. Bending a piece of metal.
  - d. Mixing two clear liquids to form a yellow liquid.
  - e. Burning wood.

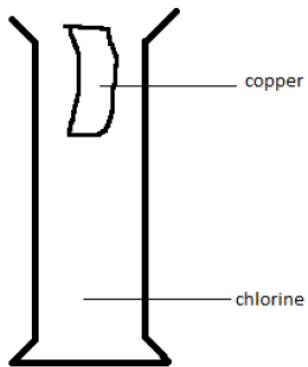
(5)

2. When magnesium (a chemical) reacts with acid, it fizzes and eventually disappears. The test tube becomes hotter. Identify **3** signs that a chemical reaction has taken place

(3)

3. On Zainab's first day in S2 Science, her teacher demonstrated an experiment to the class. Here is the report that Zainab wrote in her jotter:

*Mr Smith took a really thin piece of copper and put it in a jar of gas. The gas was chlorine. He told us to keep clear of the chlorine. When the copper went in the gas, it shrivelled up. Then it went on fire. When it stopped there was yellow stuff in the bottom of the jar. This is called a CHEMICAL REACTION.*



The diagram shows a vertical jar with a wide mouth. Inside the jar, there is a piece of copper, which is depicted as a thin, irregularly shaped strip. A label 'copper' points to this strip. At the bottom of the jar, there is a horizontal line representing a layer of yellow substance. A label 'chlorine' points to this layer.

From Zainab's report, identify 2 signs that a chemical reaction has taken place.

(2)

(Total /10)

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### Core Homework 2

#### Acids, Alkalis, Neutral Solutions and Indicators

1. Magnesium sulfate is a medicine. Magnesium sulfate can be produced in the following reaction:



From this information, identify the reactants. (2)

2. Zoe and Daniel were asked to complete a research task at home looking at the pH of different substances found in the home.

They wrote down their results as follows:

Bicarbonate of soda – pH 9; vinegar – pH 4; shampoo – pH 6; oven cleaner – pH 14; Irn Bru – pH 3; milk – pH 8; indigestion remedy – pH 10; washing up liquid – pH 7; lemon juice – pH 3; tap water – pH 7.

Present these results in a table under the following headings:

Acidic Substances	Neutral Substances	Alkaline Substances

(3)

3. The following is a report given by the Scottish Environmental Protection Agency to a fish farmer.

<p style="text-align: center;"><b>SEPA Report</b></p> <p><u>Water Test</u> Water showed a pH of 5.</p> <p><u>Action Needed</u> Water should be treated to increase the pH.</p>
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- a) Describe how the Scottish Environmental Protection Agency could have used universal indicator to test the pH of the farmer's water. (2)
- b) What kind of substance could the farmer add to the water to increase the pH? (1)
4. Bees and wasps both sting, but the treatment for a sting from a bee is different from that for wasps. Give an example of how you might treat a bee sting and explain why. (2)

(Total /10)

**Optional Homework 3**  
**Diluting and Neutralising Acids and Alkalis**

1. State what happens to the pH when an
    - a) acid is diluted
    - b) alkali is diluted.

(2)
  
  2. Write the basic word equation for a neutralisation reaction between an acid and an alkali.

(1)
  
  3. Bees and wasps both sting, but the treatment for a sting from a bee is different from that for a wasp.  
Give an example of how you might treat a wasp sting and explain why.

(2)
  
  4. State the meaning of the arrow,  $\rightarrow$ , in a word equation.

(1)
- (Total /6)