

**YEAR: 9**

**SUBJECT: SCIENCE**

**TEST: Chemical reactions**

**TIME: 50 mins**

**QUESTIONS: Part A: Multiple Choice Questions (10 marks)**

**Part B: Short Answer Questions (21 marks)**

**Part C: Extended Response (5 marks)**

**TOTAL MARKS: 36 marks**

**DO NOT WRITE ON OR MARK THIS PAPER**

**SECTION ONE: Multiple Choice Questions (1 mark each)**

**Answer this section on the separate multiple choice answer sheet**

1. Copper reacts with sulfur dioxide to form copper sulfide and oxygen gas. The reactants for this reaction are:

A) copper

B) copper and sulfur dioxide

C) copper sulfide and oxygen gas

D) copper, sulphur dioxide, copper sulfide and oxygen gas+

1. Which of the following is the balanced chemical equation showing the corrosion of aluminium?

A) Al + O2 → Al2O3

B) 4Al + O2 → 2Al2O3

C) Al + 3O2 → 2Al2O3

D) 4Al + 3O2 → 2Al2O3

1. When petrol explodes, it releases energy in the form of heat and light. This reaction is an example of:

A) an endothermic reaction

B) an exothermic reaction

C) a neutralisation reaction

D) a corrosion reaction

1. Which of the following reactions shows the rusting of iron?

A) 2Cu + H2O + CO2 + O2 → Cu(OH)2 + CuCO3

B+) 2Ag + H2S → Ag2S + H2

C) 2Na + 2H2O → 2NaOH + H2

D) 4Fe + 3O2 + 2H2O → 2Fe2O3.H2O

1. An acid reacts with a metal. Identify its products.

A) a salt + hydrogen gas

B) a salt + water

C) a salt + water + carbon dioxide

1. D) glucose + oxygen gas
2. What type of substance would have a pH of 7?

1. Acidic
2. Basic
3. Neutral
4. Alkaline
5. A substance that changes colour in the presence of an acid or a base:
6. reactant
7. product
8. pH
9. indicator
10. The law of conservation of mass explains why, in a chemical reaction:
11. when rearranging reactant atoms to form products, the mass changes significantly.
12. energy cannot be created nor destroyed, only transformed or transferred.
13. the total mass of reactants equals the total mass of products.
14. new atoms are created from the reactant atoms.
15. On the pH scale of acidity:
16. neutral substances are 7, basic substances are less than 7 and acidic substances are

greater than 7.

1. neutral substances are 7, acidic substances are 0 and basic substances are 14.
2. neutral substances are 0, acidic substances are between 0 and 7, and basic

substances are greater than 7.

1. neutral substances are 7, acidic substances are less than 7 and basic substances are

greater than 7.

1. Oxidation reactions are any chemical reaction that:
2. absorbs energy from the surroundings.
3. involves carbon dioxide.
4. involves oxygen atoms being removed from any compound.
5. involves an element combining with oxygen.



**SEMESTER TWO 2018**

**Chemical reactions:**

**ANSWER BOOKLET**

**NAME**:

**FORM:** **DATE:**

Multiple Choice Short Answer Extended Response Total

**/36**

**/5**

**/21**

**/10**

**SECTION ONE:** Multiple choice answers

Cross (X) through the correct answer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1** | a | **X** | c | d |
| **2** | a | b | c | **X** |
| **3** | a | **X** | c | d |
| **4** | a | b | c | **X** |
| **5** | **X** | b | c | d |
| **6** | a | b | **X** | d |
| **7** | a | b | c | **X** |
| **8** | a | b | **X** | d |
| **9** | a | b | c | **X** |
| **10** | a | b | c | **X** |

**SECTION TWO: Short Answer (21 marks)**

Answer the questions in the spaces provided.

**Question 11 (4 marks)**

Ethane (C2H6) reacts with oxygen gas (O2) to form carbon dioxide (CO­2) and water vapour (H2O).

**a)** **Identify** the reactants of this reaction.

**b)** **Identify** the products of this reaction.

**c)** **Construct** a word equation for this reaction.

**d)** **Construct** an unbalanced formula equation for this reaction.

a. Reactants : ethane + oxygen gas – (1 mark)

**b** Products : carbon dioxide + water vapour – (1 mark)

**c** ethane + oxygen → carbon dioxide + water vapour – (1 mark)

d C2H6 + O2 → CO2 + H2O – (1 mark)

**Question 12 (5 marks)**

Magnesium burns in oxygen gas to form magnesium oxide. Its unbalanced formula equation is:

Mg + O2 → MgO

1. **Use** this equation to **identify** the chemical formula for magnesium oxide.
2. **Construct** a word equation describing this reaction.
3. **Identify** which element (Mg or O) is unbalanced in the above equation.
4. **Balance** the above equation.
5. **Identify** the type of reaction that has taken place.

a .MgO – (1 mark)

b. Magnesium + oxygen gas → magnesium oxide – (1 mark)

c. O is unbalanced – (1 mark)

d. 2Mg + O2 → 2MgO – (1 mark)

e. Oxidation reaction or if someone writes corrosion reaction give – (1 mark)

**Question 13 (3 marks)**

**Classify** each of the following reactions as corrosion, acid/metal, neutralisation, or acid/carbonate reactions:

2HCl + Mg → MgCl2 + H2 acid/metal – (1 mark)

2HCl + CaCO3 → CaCl2 + H2O + CO2 acid/carbonate – (1 mark)

H2SO4 + 2NaOH → Na2SO4 +2H2O neutralisation – (1 mark)

**Question 14 (4 marks)**

Two things can happen to an iron/steel shipwreck when it settles on the ocean floor. It can stay on the floor OR it can sink into the mud. If it stays on the ocean floor, it will rust. If covered by mud, it is sometimes preserved without any rusting.

The rusting of iron is shown in the equation:

4Fe + 3O2 + 2H2O → 2Fe2O3.H2O

**a)** **Use** this equation to **identify** the chemical formula for rust.

**b)** **List** the three reactants needed for rust to form.

**c)** **Propose** a reason why iron might not rust if the shipwreck is covered by mud.

**a** Fe2O3.H2O – (1 mark)

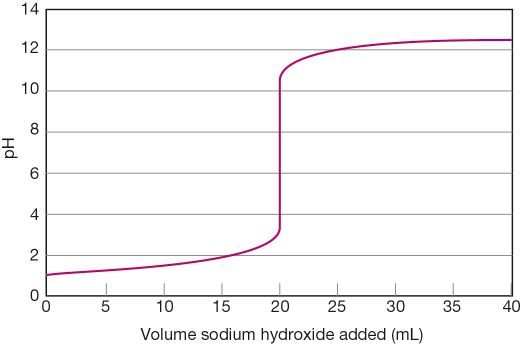
**b** Iron (Fe), oxygen gas (O2) and water (H2O). – (1 mark)

**c**  Mud is wet but sometimes it has no oxygen in it (1 mark). Hence one of the reactants is missing. (1 mark)

**Question 15 (5 marks)**

Use this graph to answer the following questions:

Increasing volumes of sodium hydroxide (NaOH) were added to a solution of hydrochloric acid (HCl). As it was added, the pH changed according to the graph shown below.



1. State the pH of the solution at the start of the experiment.
2. Determine the volume of sodium hydroxide that is needed to be added to exactly neutralise the acid.
3. Determine the pH when 16 mL of sodium hydroxide was added.
4. Determine the total volume of sodium hydroxide added in the experiment.
5. At the end of the above experiment, what type of solution was formed?

**a) pH of 1 –** (1 mark) **b) 20mL –** (1 mark) c) **pH 2 –** (1 mark)

**d) 40 mL –** (1 mark) d) **The solution becomes ALKALINE –** (1 mark)

**SECTION THREE: Extended Response (5 marks)**

Acids are commonly found around us. Bases can be described as the ‘chemical opposite’ of acids.

1. List at least two properties of **acids** and **bases**.

1. What is the difference between a strong and a weak acid?
2. Describe two effects acid rain can have on the environment.

a) Acids – Any two properties, some examples are given below (½ mark each Total= 1)

1. Have a sour taste
2. Produces a prickling or burning sensation when they come into contact with the skin or they are corrosive
3. They all contain at least one hydrogen atom
4. They tend to react with many metals and releases hydrogen gas and a salt

Bases – Any two properties, some examples are given below (½ mark each Total= 1)

1. They are bitter and feel slippery or soapy to touch
2. They react with fats and oils to produce soaps
3. Some bases can dissolve in water and are called as alkalis
4. They are neutralised by acids producing a salt and water
5. Strong acids are dangerous because they can burn through objects.

Weak acids are much safer as we can eat and drink some of them. (½ mark each Total= 1)

1. Acid rain is corrosive to building materials, marble and limestone. Acid rain can damage limestone statues or roller doors. (Any two appropriate effects Total = 2)

End of Test