Key

Year 9 Science

Chemistry Test 2: Reaction Types

41

SECTION 1: MULTIPLE CHOICE (1 mark each)
Circle your answer on the multiple choice answer sheet.

1. Which of the following is the best example of an acid?
   a) HCl
   b) NaOH
   c) Zn
   d) Fe

abababb
cdbdc
bdc.bab
dab

2. The acid with the formula H_2SO_4 is called
   a) hydrochloric acid.
   b) sulfuric acid.
   c) nitric acid.
   d) ethanoic acid.

3. The correct formula of the base sodium hydroxide is
   a) NaOH
   b) SoOH
   c) HONa
   d) NaSO

4. When Magnesium metal is added to hydrochloric acid:
   a) the chemicals react to form a salt and water only
   b) the chemicals react to release hydrogen gas
   c) the chemicals react to release carbon dioxide gas
   d) no observable reaction occurs

5. The substance you begin with in a chemical reaction are called
   a) chemicals
   b) reactants
   c) products
   d) compounds

6. Which of the following does not indicate that a chemical change has taken place:
   a) a white precipitate is formed
   b) a green but odourless gas
   c) a new substance being formed
   d) a solid is formed from a liquid

7. Which sentence best matches the following word equation

Magnesium + Hydrochloric acid → Hydrogen + magnesium chloride

a) Magnesium reacts with hydrogen to form hydrochloric acid and magnesium chloride.

b) Hydrochloric acid and hydrogen react to form magnesium and magnesium chloride.

c) Magnesium reacts with hydrochloric acid to form hydrogen and magnesium chloride.

d) Hydrogen reacts with magnesium chloride to form magnesium and hydrochloric acid

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

a) an endothermic reaction

b) neutralization reaction

c) a corrosion reaction

d) an exothermic reaction

9. The formula for hydrogen gas is

a) H

b) H_2

c) O_2

d) CO_2

10. Which of the following is **not** a sign that a chemical change has occurred?

a) a spontaneous change in temperature

b) precipitation (solution goes cloudy)

c) smell or bubble are given off

d) evaporation

11. When an acid reacts with a carbonate what type of substances are produced:

a) hydrogen and carbon dioxide

b) a salt and water

c) a salt, water and carbon dioxide

d) none of the above

12. What number is needed in front of the NaF in order for this equation to be balanced

12

$$\_\ NaF + Br_2 \rightarrow\ 2NaBr + F_2$$

a) 1
b) 2
c) 3
d) 4

13. Which of the following is an example of a chemical reaction?
a) The breakdown of food into energy
b) Photosynthesis in plants
c) Metal rusting
d) all of the above

14. What does a catalyst do to a chemical reaction?
a) Stops the reaction
b) Starts the reaction
c) Speed up the reaction
d) Slows down the rate of reaction

Next three questions are based on the following equation

Sodium carbonate + ethanoic acid → carbon dioxide + water + sodium ethanoate

15. Which of the following is a reactant?
a) Sodium
b) Sodium carbonate
c) Carbon dioxide
d) Water

16 Which of the following is a product?
a) Carbon dioxide
b) ethanoic acid
c) Sodium
d) Ethanoate

17. This reaction could be described as
a) a physical change
b) a chemical change
c) an indicator change
d) a precipitation reaction

18. A reaction that causes heat to be absorbed, so the test tube feels very cold is called a

(18)

a) combustion reaction.
b) precipitation reaction.
c) neutralisation reaction.
(d) endothermic reaction.

19, If a precipitation reaction occurs, the observation would be:
(a) the solution goes from clear to cloudy.
b) the solution gets hot.
c) the solution produces bubbles of gas.
d) it starts to rain outside

20. Which of the following is a combustion reaction
a) Methane + carbon $\rightarrow$ carbon dioxide + hydrogen
(b) Methane + oxygen gas$\rightarrow$ carbon dioxide + water
c) Copper oxide + carbon $\rightarrow$ copper + carbon dioxide
d) Silver nitrate + copper $\rightarrow$ silver + copper nitrate

SECTION 2: WRITTEN

Write all answers in the spaces provided. If you need more space, ask for some lined paper

1. Match the following: (4 Marks)

a) Aerobic respiration	A reaction that occurs when there is plenty of oxygen. It produces carbon dioxide and water vapour — d — 4
b) Law of conservation of mass	A chemical equation that has the same numbers of each atom on both sides of the arrow. — c — 3
c) Balanced formula equation	A reaction that uses oxygen to release energy stored in glucose (this happens in every cell in your body to give each cell energy) — a — 1
d) Complete combustion	Atoms are not created or destroyed in a chemical reaction. They can only be rearranged — b — 2

2. Write word equations (names only) from the following descriptions. **(2 Marks)**
   a) Carbon dioxide is a product of the combustion of octane in oxygen from air. Water is also produced.

octane + oxygen (O_2) → carbon dioxide (CO_2) + water vapour (H_2O)

   b) When silver nitrate is added to sodium chloride, a solid precipitate of silver chloride is produced, while sodium nitrate remains in solution.

silver nitrate + sodium chloride → silver chloride + sodium nitrate

3. Balance the following reactions and classify them as either combustion, acid/metal, corrosion or neutralisation. (6 marks)

a) $2HCl + Mg \rightarrow MgCl_2 + H_2$ ✓ Acid/metal

b) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + H_2O$ ✓ ✓ Combustion

c) $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ ✓ ✓ Neutralisation

4. Alice and Joanne placed a piece of metal in a test tube which contained liquid. Five observations were made about the reaction they witnessed. They recorded their results in the table below:

Observations	Results	
	Start	Finish
Temperature	23C	45C
Colour	Colourless	Colourless
Liquid	Clear	Clear
Piece of metal	Can be seen	Can't be seen
Air above test tube	No smell	Strong smell

a) Did Alice and Joanne observe a physical reaction or a chemical reaction? **(1mark)**

Chemical reaction ✓

b) Which two observations in the table support your answer to part a? Explain why **(2 Marks)**

Change (increase) in temperature
Metal can't be seen (dissolves) ✓
Produces a strong smell ✓

5. How does particle size affect the rate of a chemical reaction? **(1 mark)**

Decreasing particle size → increased particle surface area → higher collision rate → faster rate of reaction. ✓

6. How does temperature increase the rate of a chemical reaction? **(1 mark)**

Increasing temperature → particles collide more often and with more energy → increased rate of reaction. ✓

7. Classify the following as physical or chemical changes **(4 marks)**

a) freezing water to make ice phys ✓
b) ripping paper phys ✓
c) burning candle wax chemical ✓
d) evaporating salt out of water phys ✓