

CHEMISTRY FORM TWO
MARKING SCHEME:

1. Fractional distillation of liquid air is usually used to separate various gaseous mixtures in air. Explain how to;
- a) Remove carbon (IV) oxide. (1mk)
Passing air through concentrated sodium hydroxide or potassium hydroxide solution.
- b) Remove water. (1mk)
Cool to -25°C to remove water.
- c) Obtain nitrogen. (1mk)
Cool to -200°C and carry out fractional distillation to obtain nitrogen gas.
2. The diagrams below represent two iron nails with some parts covered tightly with zinc and tin respectively. What observations would be made at the exposed points R and Z if the wrapped nails are left in the open for several days? Explain.
At R: No rusting occurred $\sqrt{1/2}$. Zinc is more reactive than iron hence it reacts with moist air instead of iron $\sqrt{1}$.
At Z: Rusting occurred $\sqrt{1/2}$. Tin is less reactive than iron hence iron reacts with moist air to form rust. $\sqrt{1}$
3. The Diagram below is set-up for the laboratory preparation of oxygen gas.

Diagram

- a) Name solid R
Manganese (IV) oxide. $\sqrt{1}$
- b) Write an equation for the reaction that takes place in the flask. (2mks)
- $$2\text{H}_2\text{O}_2(l) \xrightarrow[\text{IV oxide}]{\text{Manganese}} \text{O}_2(g) + 2\text{H}_2\text{O}(l) + 2\text{H}_2\text{O}(l)$$
- c) Give one commercial use of oxygen. (1mk)
- **Welding**
 - **Steel making**
 - **Breathing aid/ hospitals**
- Accept any.*

4. An element y has an electron arrangement of 2.8.5

- a) State the period and group which the element belongs. (2mks)

Group V

Period 3

- b) Write the formula of the most stable ion formed when the element Y ionizes (1mk)



- c) Explain the difference between the atomic radius of element Y and its ionic radius (2mks)

The ionic radius is larger because of the electron-electron repulsion between the existing electrons and the added electron.

5. Lithium has two isotopes with mass numbers 6 and 7. If the R.A.M (relative atomic mass) of Lithium is 6.94, determine the percentage abundance of such isotope.

$$6x + 7y = 694$$

$$(x + y = 100)6$$

$$6x + 7y = 694 \quad -$$

$$6x + 6y = 600$$

$$y = 94\%$$

$$x = 6\%$$

6. Other than their location in the atom, name two other differences between an electron and a proton.(2mks)

Electron – Negative charge

Proton – Positive charge

7. Write down the electronic configuration of the atoms with the following atomic numbers(2mks)

a) 7 - **2.5**

b) 9 - **2.7**

c) 14 - **2.8.4**

d) 18 - **2.8.8**

8. An atom of an element has the electronic configuration 2.8.2

- a) State its atomic number

12

- b) To which group of the periodic table does it belong? Explain.

Group 2. It has two electrons in its outermost energy level.

- c) Is the element a metal or a non-metal? Explain

A metal. It has less than 4 electrons in its outermost energy level.

(1mk)

- d) If the atom has 14 neutrons in its nucleus state its mass number. (1mk)
26
9. Rubidium (Rb) is a member of the alkali metals. Predict how the element reacts with: (3mks)
- a) Water - **vigorously**
 - b) Air - **vigorously**
 - c) Chlorine - **less vigorously**
10. Briefly explain the following observations.
- a) Noble gases are generally unreactive. (1mk)
Noble gases are chemically stable because their outer energy level are full.
 - b) Alkaline earth metals are generally less reactive than alkali metals in the same period. (2mks)
Alkali metals react by losing the one electron from their outermost energy level.