

Uganda Advanced Certificate Of Education

Senior five test one-2025

P525/1 (theory)

Chemistry paper 1

Attempt all items in this paper

Where necessary: Cu=64, C=12, H=1, O=16, S=32

1 mole of gas occupies 22400cm^3 at s.t.p.

1 mole of a gas occupies 24000cm^3 at s.t.p

Name.....**COMB**.....

Time allowed: $1\frac{1}{2}$ hours

Expected score.....**%**

Item one

A group of researchers used a mass spectrometer to determine the relative atomic mass of chlorine. In their findings, chlorine had three isotopes Cl-35 and Cl-37 and mass spectrum had three significant peaks at 70,72 and 74. The report shows that the relative atomic mass of chlorine is 35.5.

Juma a new comer in senior five science is inquisitive about this machine and the mass spectrum obtained.

Task:

Using the knowledge of chemistry, you have obtained;

(a) Explain to him:

- (i) The mode of operation of the machine
 - (ii) Why only three peaks were observed on the mass spectrum
 - (iii) One other use of the machine in daily life
- (b) Calculate the percentage abundance of each isotope of chlorine from the data and hence sketch the mass spectrum of chlorine.

Item two

On analysis by senior five chemistry students on compound K, it was discovered that compound K contains **39.9% Copper, 21.3% Sulphur and the rest being Oxygen**. Husina a senior four student finds this information strange and she has approached you for help about substance K.

As a chemistry student help her to understand compound with its:

- (a) **Empirical** formula of K.
- (b) **Molecular** formula of K provided **0.05 moles** of X weighs **8.006 g**.
- (c) **IUPAC** name compound K

Item three

While in the laboratory, an argument rose up between two senior three students after seeing certain information on one of the bottles in the laboratory. This information is for compound D which is an organic acid whose formula is: $H_xC_yO_z \cdot nH_2O$. On its bottle its written that D contains 26.7% Carbon, 2.2% hydrogen and 71.1% oxygen by mass. On the same bottle its written that it has a vapour density of $5.625 \times 10^{-3} \text{gcm}^{-3}$ at s.t.p. Your of chemistry has requested to help the senior three students under the issue at hand. In your message include the following:

- (a) Determine empirical formula of the anhydrous form of Q.
- (b) Deduce the values of x, y and z.
- (c) Determine the value of n and hence the formula of the hydrated D.
- (d) Write the IUPAC name of D.
- (e) Determine the percentage of water of crystallization in D.

END

Welcome to A-level @ 2025