

# FORM FOUR CLUSTER KCSE MODEL 3

## CHEMISRY PAPER 1 QUESTIONS

1. State one use of each of the following laboratory apparatus.

a) A deflagrating spoon.

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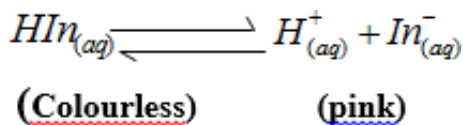
b) A pipe clay triangle.

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2. Explain how a sample of copper (II) sulphate crystals can be obtained from a mixture of sulphur and copper (II) sulphate crystals without using water.

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3. Indicators are usually weak acids or bases and dissociate as shown in the following equation:



What observation is made on adding each of the following? Explain.

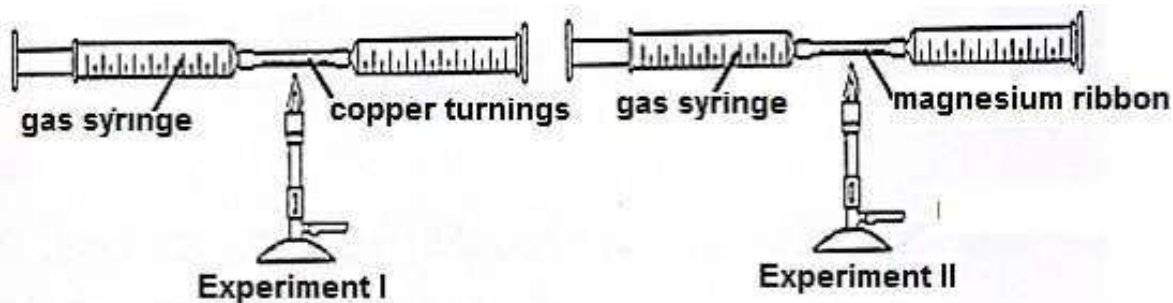
(i) Sulphuric (VI) acid to the indicators

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(ii) Sodium hydroxide solution.

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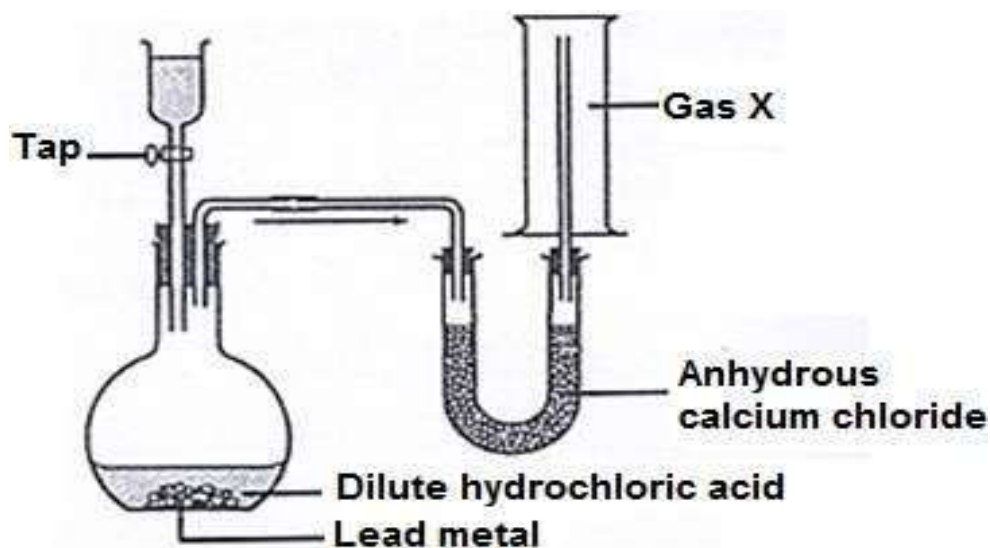
4. Two similar experiments were set up as shown below.



In which experiment was a larger volume of air used? Explain.

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5. a) In an attempt to prepare dry hydrogen gas, a class set up the experiment below.



(i) Identify one mistake in the set up.

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(ii) State two observations made during the experiment.

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b) Write an equation for the reaction between iron and steam.

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6. Neon has relative atomic mass of 20.2. Given that neon has isotopes of mass number 20 and 22,

determine the percentage abundance of the two isotopes.

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7. Draw a dot (.) and cross (x) diagram for the compound hydrogen cyanide (HCN).

(Atomic numbers H=1, C=12, N=7)

8. The first successive ionization energies of an element D are shown in the table below

| Element | Ionization energy/kJmol <sup>-1</sup> |                 |                 |                 |                 |                 |
|---------|---------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|         | 1 <sup>st</sup>                       | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup> | 5 <sup>th</sup> | 6 <sup>th</sup> |
| D       | 1086                                  | 2353            | 4621            | 6223            | 37832           | 47278           |

a) Define the term first ionization energy.

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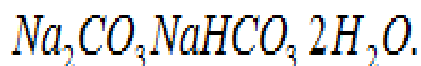
b) Write an equation to show the third ionization energy of element D.

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c) Use the table above to deduce which group of the periodic table contains element D. Explain

your answer. ....

9. Trona is a double salt of sodium with a formula



The trona is collected, dried and heated to convert it to soda ash.

i. Write an equation for the decomposition of Trona by heat.

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ii. State two uses of sodium carbonate.

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10. An electric current was passed through a solution of molten potassium fluoride using inert electrodes.

a) Name the products at cathode.

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b) Write an equation for the reaction at the anode.

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11. Chlorine can be prepared by using the following reagents: sodium chloride, concentrated sulphuric

(VI) acid and potassium permanganate.

a) What is the role of each of the following in the reaction?

(i) Concentrated sulphuric (VI) acid.

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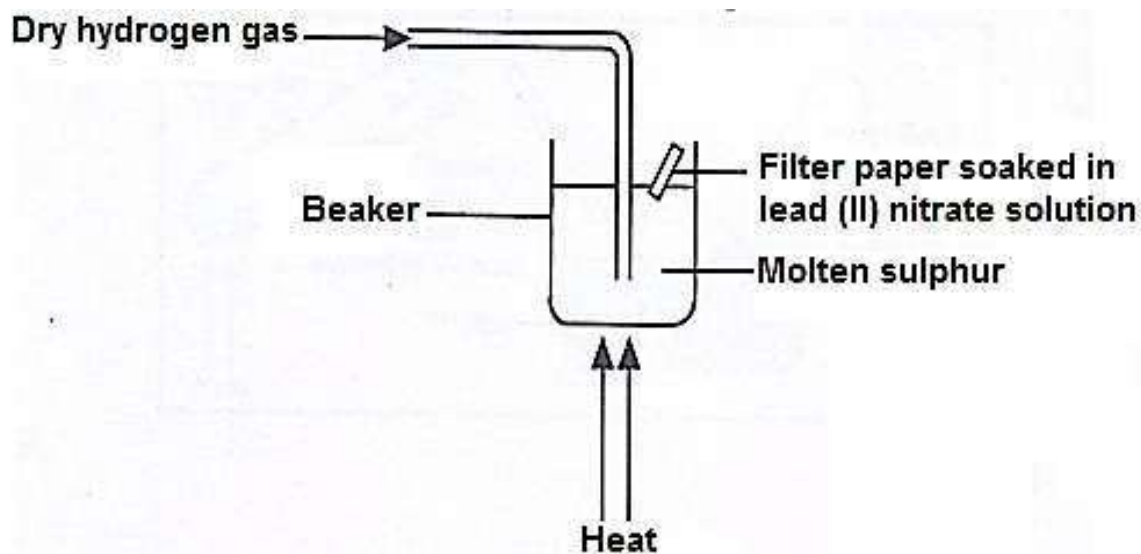
(ii) Potassium permanganate.

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b) Name the bleaching agent formed when chlorine gas is passed through cold dilute sodium hydroxide solution. ....

12. What volume of air is needed to burn propane at the rate of 2dm<sup>3</sup> per minute for an hour?

13. A stream of hydrogen was bubbled through molten sulphur as shown below.



(i) State and explain the observation made on the filter paper.

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**(ii) Write down an equation for the reaction taking place in the beaker.**

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**14. Write an ionic equation for the reaction between copper (II) sulphate and Ammonium hydroxide.**

**(i) With a small amount of ammonium hydroxide.**

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**(ii) With excess ammonium hydroxide.**

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**15. A hard glass test tube containing mercury (II) oxide weighed 16.72g. The tube was attached on an apparatus for measuring the oxygen evolved and it was then heated. After heating, the test tube and the mercury weighed 16.17 g. The oxygen given off when measured dry at and 760mmHg occupied a volume of 400cm<sup>3</sup> (Molar gas volume at STP=22.4dm<sup>3</sup>). Calculate the R.F.M of oxygen using this information**

**16.**