

FORM 2 END TERM 2 2020

CHEMISTRY

1.a) Describe how to light and obtain a non- luminous flame from a Bunsen burner.(3 mks)

b) State one disadvantage of the flame obtained above.(1 mk)

2. State the type of changes undergone by the following substance,

a) Obtaining kerosene from crude oil.(1 mk)

b) Souring of milk.(1 mk)

3. The table below shows liquids that are miscible and those that are immiscible

liquid	L3	L4
L1	Miscible	Miscible
L2	miscible	immiscible

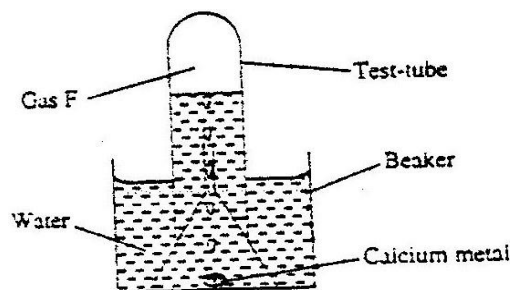
Use the information given to answer the question that follow

1. Name the method that can be used to separate L1 and L2 from a mixture of two.(1 mk)

II) Describe how a mixture of L2 and L4 can be separated.(2mks)

4. A beekeeper found that when stung by a bee application of a little solution of sodium hydroxide helped to relieve irritation from the affected area. Explain.(2 mks)

5. The set up below was used to collect gas F produced by the reaction between water and calcium metal



i) Name gas F.(1 mk)

ii) At the end of the experiment the solution in the beaker was found to be a weak base. Explain why the solution is a weak base.(2 mks)

III) Give one laboratory use of the solution formed in a beaker.(1 mk)

6. Write the formula for the oxide of

A) Magnesium

b) Chlorine

7. The following set-ups were used to investigate the rusting of iron. Study it and answer the question that follow.

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
23 Describe how the percentage by mass of copper in copper carbonate can be determined. (3 marks)

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
24 The following set up of three test-tubes was used to investigate rusting of iron. Study it and answer the questions that follow.



Tap water
Iron nails
A



Oil
Iron nails
B



Anhydrous calcium chloride
Boiled water
C

(a) Give a reason why rusting did not occur in test-tube C. (1 mark)

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(b) Aluminium is used to protect iron sheets from rusting. Explain two ways in which aluminium protects iron from rusting. (2 marks)

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A) Give a reason why rusting did not occur in test tube c.(1 mk)

b) Aluminum is used to protect iron sheets from rusting. Explain two ways in which aluminum protects iron from rusting.(2 mks)

8. When hydrogen gas is passed over heated lead (ii) oxide, a reaction occurs as shown in the set-up below.

2

1 Charcoal is a fuel that is commonly used for cooking. When it burns it forms two oxides. (2 marks)

(a) Name the two oxides.

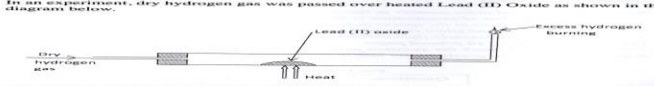
(b) State one use of any of the two oxides. (1 mark)

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2 Iron (III) oxide was found to be contaminated with copper (II) sulphate. Describe how a pure sample of iron (III) oxide can be obtained. (3 marks)

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3 In an experiment, dry hydrogen gas was passed over heated Lead (II) Oxide as shown in the Diagram below. (3 marks)



State and explain the observations made in the combustion tube.

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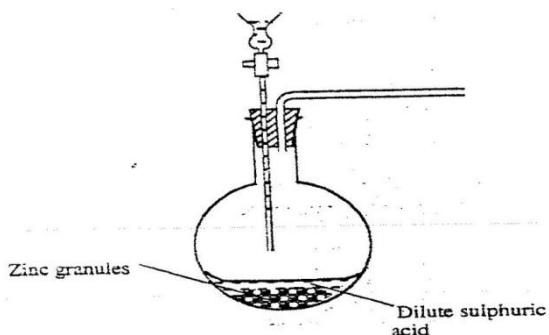
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State what happens inside the combustion tube (1 mk)

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9. The set-up below was used to prepare hydrogen gas



A) Complete the diagram to show how a dry sample of hydrogen gas can be collected.(3 mks)

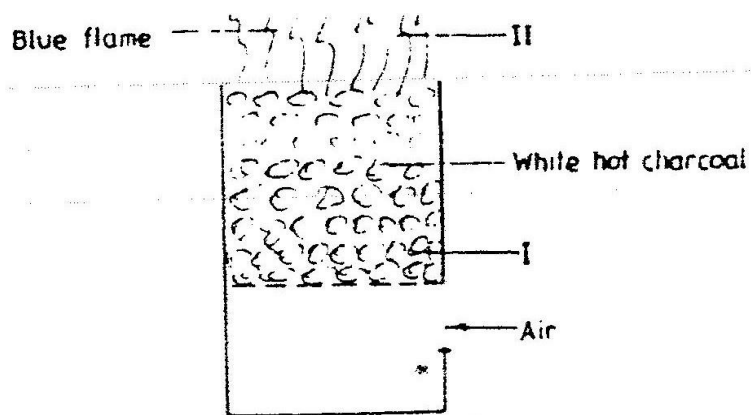
b) Write an equation for the reaction which take place when hydrogen gas burns in air.(1 mk)

10. Both graphite and molten lead (ii) chloride conducts electricity. State the substance that conducts electricity in:

A) Graphite.(1 ½ mks)

b) Molten lead (ii) chloride.(1 mk)

11. The diagram below represents a charcoal burner. Study it and answer the question that follows



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A) Write equations for the reactions taking place at (i) and (ii) above.(2 mks)

i)

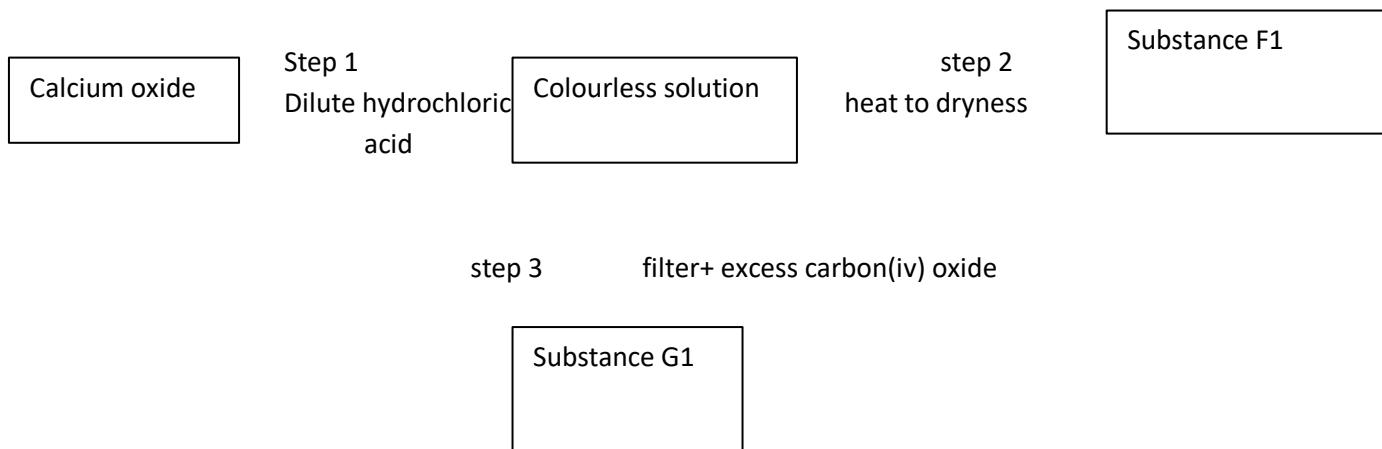
ii)

b) At region marked y an oxide of carbon forms. This oxide is often referred to as a “silent killer”

i) Identify the oxide.(1 mk)

ii) Why is this oxide described as a silent killer.(2 mks)

12. Study the flow chart below and answer the questions that follow



A) Give the name of the process that take place in step 1.(1 mk)

b) Give

i) The name of substance G.(1 mk)

ii) Suggest one use of carbon (iv) oxide.(1 mk)

13. The table below shows some of the elements of the periodic table and their atomic numbers, atomic masses and melting point. The letters are not the actual symbols of the elements

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Element	B	C	D	E	F	G	H	I	J	K
Atomic no	7	8	19	15	2	9	6	16	12	11
Atomic mass	14	16	39	31	4	19	12	32	40	23
Melting point oc	-209	-218	63	44	-272	223	VARY	113	669	98

- a) Select two elements with oxidation state of -3.(2 mks)
- b) Which elements represent the most powerful reducing agent.(1 mk)
- c) How does the atomic radii of D compare with that of K. Explain.(2 mks)
- d) How do you compare the electrical conductivity of element J and K. Give your reason.(2 mks)
- e) Select two elements which when reacted with element G forms a compound that conducts electricity both in molten and aqueous state.(2 mks)
- f) Select two elements that have a common valency. State the elements.(2 mks)
- g) In which group and period do D and G belong?
 (D) Group _____ period. (1 mk)
 (G) Group _____ period. (1 mk)
- h) Select one element stored in
 a) Water-
 b) paraffin.- (2 mks)
14. a) Define the term "salt"(1 mk)
- b) Describe how you can prepare crystals of sodium chloride under laboratory conditions starting with 100cm³ of a solution of dilute hydrochloric acid.(3 mks)

c) State at least two uses of salts.(2 mks)

15. State term(s) used to describe the processes below when salts are exposed to air for some time

i) Anhydrous copper ii sulphate becomes wet.(1 mk)

ii) Fresh crystals of sodium carbonate $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ become powdery.(1 mk)

16. Using dots (.) and crosses(x) draw a diagram to show bonding in ammonia.(2 mks)

17. In terms of structure and bonding explain why graphite

A) Conducts electricity

b) Has a higher melting point.(2 mks)

18. a) What is a radical as used in chemistry.(1 mk)

b) State the formula of the compound formed when the following radicals combine

i) Ammonium, NH_4^+ and sulphate, SO_4^{2-} .(1 mk)

ii) Calcium ion Ca^{2+} and phosphate, PO_4^{3-} ion.(1 mk)

19. Study the structure below which represents an allotrope of carbon

A) Identify the allotrope. (1 mk)

b) State one of its uses, giving reasons for your answer. (2 mks)

20. Ethanol, C_2H_5OH has a boiling point of $78^\circ C$ while dimethylether, $(CH_3)_2O$ has a boiling point of only $-33^\circ C$, yet dimethyl ether has a higher molecular mass than ethanol. Explain the observation in terms of structure and bonding. (2 mks)

21. The table below gives information about element in period three of the periodic table

element	Atomic no	Atomic radius	Ionization energy
Sodium	11	0.002nm	50kj
Magnesium	12	0.001nm	70kj
Aluminum	13	0.0005nm	93kj
Silicon	14	0.0001nm	107kj

a) State and explain the changes in atomic radius across the period. (2 mks)

b) Give reason(s) for increases ionization energy across the period. (2 mks)

22. The grid below represents parts of the periodic table. Study it and answer the questions that follow
letter do not represent actual symbols of elements-draw the grid

A									
					m		q	w	
C					d		r		
							s	p	

i) Select two elements with a charge of -2. (2 mks)

ii) Which is the most reactive non metal above. (1 mk)

iii) Give the formula of the oxide of D. (1 mk)

iv) Show on the grid an element which is mono atomic. (1 mk)

v) On the grid provided assign and indicate the position of iron metal. (1 mk)

vi) Compare the atomic radii of element d and r. Explain. (2 mks)

vii) Element m forms 2 isotopes whose isotopic composition is as given below

$^{12}_6\text{M}$ (75%) and $^{14}_6\text{m}$ (25%). Calculate its relative atomic mass. (3 mks)

23. Name a property of neon that makes it suitable for use in electric lamps. (1 mk)

24. Four metals F, G, H and J were each separately added to cold water and steam. Metal F and H reacted with cold water and very explosively with steam. Metals G and J showed no reaction with cold water.

A) Suggest the identity of metal H. (1 mk)

b) Write an equation for the reaction between metal F and steam. (1 mk)

c) Metal J forms a hydroxide whose formula is J(OH)_2

Suggest the chemical family of metal. (1 mk)

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d) Suggest a metal above which forms a monovalent ion.(1 mk)