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233/1 – **CHEMISTRY** – Paper 1
(THEORY)
SEPT.2018 – 2 hours

04

Name ..... Index Number .....

Candidate's Signature ..... Date .....

Instructions to candidates

(a) *Write your name and index number in the spaces provided above.*
(b) *Sign and write the date of examination in the spaces provided above.*
(c) *Answer **ALL** the questions in the spaces provided in the question paper.*
(d) *KNEC mathematical tables and silent non-programmable electronic calculators may be used.*
(e) *All working **MUST** be clearly shown where necessary.*
(f) ***This paper consists of 24 printed pages.***
(g) ***Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.***
(h) ***Candidates should answer the questions in English.***

For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1 – 28	80	

K.C.S.E PREDICTIONS & REVISION KIT CHEMISTRY PAPER 1

MARKING SCHEME-2014

1. A- Chimney (1mk)
   B-air hole (1mk)
2. (a) Q- period two because it has two energy level (1mk)
   (b)Q has 5protons while P has 3 protons .These protons in each are pulling the same number of energy level s .Therefore the pull in Q is more than in P making Q to have a small radius .(3mks)
3. (a) It is lighter than air (½mk)
   (b) Dipping a burning splint that produces a pop sound (1/2mk)
   (c) Copper is less reactive and therefore does not react with steam (1mk)
4. (i) K and M (1mk)
   (ii) M because it is a strong alkali that react with aluminium hydroxide which is amphoteric. (2mk)

5. $BCO_{3(s)} + 2HCL \longrightarrow BCL_{2(aq)} + CO_{2(g)} + H_20_{((L)}$

moles of HLC = $\frac{20}{1000}$x1 =0.02 moles (1/2mk)

moles ratio BCO_3 : HLC =1:2

.,. MOLES OF BCO_3 = $\frac{1}{2}$x 0.02 =0.01moies

(1/2mk)

No of moles of BCO_3 =$\frac{1}{R.F.M}$ 0.01=R.F.M of BCO_3 = $\frac{1}{0.01}$= 100

R.A.M of B = 100 –(12+48)= 40

(2MKS)

6. (a) Sublimation (1mk)
   (b) Bleaching (1mk)
   (c) Polymerization (1mk)

7. (a) Vanadium (v) oxide / V_2O_5/ Platinum Rhodium / Pt / Rh

   (i) any one

   (ii) penalize $\frac{1}{2}$mk if state symbols missing or wrong

   (b) $2SO_2\,(g) + O_2(g) \longrightarrow 2SO_3\,(g)$

   (c)Manufacture of paint chemicals / dyes /plastics / fertilizer / lead acid accumulators / explosives (3mkds)

8. (a) Anode – $4OH_{(aq)}^{-} \longrightarrow 2H_2O_{(l)} + O_{2(g)} + 4e-$ (1MK)

   Cathode $Zn_{(s)} \longrightarrow Zn_{(aq)}^{2+} + 2e-$ (1MK)

   (b) The concentration remains the same (1/2mk)

9.

10.X$\frac{t1}{2} \longrightarrow \frac{1}{2}x\frac{t1}{2} \longrightarrow \frac{1}{4}$ x $\frac{t1}{2}$ $\xrightarrow{1/8x}$ (1/2mk)

11. (a) X- hydrogen chloride (1mk)

(b) Iron (ii) chloride

$Fe_{(s)} + 2HCl_{(g)} \rightarrow FeCl2_{(s)} + H2_{(g)}$ (1mk)

12. (i) Oxidation : $Pb_{(s)} \rightarrow Pb^{2+}(aq) + 2e-$ (1mk)

(ii) Reduction : $Cu^{2+}(aq) + 2e- \rightarrow Cu(s)$ (1mk)

(b)E.M.F = +0.13=+0.47 (1MK)

13. (a) Rkr/RBr_2= 158.8/83.3 = 1.38 (1mk)

(b) Kr is lighter than Br_2 by 1.38

Kr gas moves through 1.38x10 = 13.8 cm. (1mk)

14. $3C + 4H_2 \xrightarrow[DH_1]{DH+} C_3H_8$

$C_3H_8 \xrightarrow{DH_2} 3CO_2 + 2H_2O$

$DH+ = DH_1 + DH_2$ (1mk)

(1/2mk)

=3(-393.5)+4(-285.9)-(-2220.6)

=(-1180.5+ - 1143.6)- -22206 (1/2mk)

=-2324.1+ 2220.6= -103.5 (1/2mk)

15. (a) Concentration sulphuric Acid (1mk)

(b) $H_2SO_{4(l)} + NaNO_{3(s)} \rightarrow HNO_{3(g)} + NaHO_{3(g)} + NaHSO_{4(s)}$ (1MK)

(C) It easily decomposes when exposed to light / heat

$HNO_{3(l)} \rightarrow H_2O_{(l)} + O_{2(g)}$ (1Mk)

16.(a) During a busy day the vehicles move at slow speed causing incomplete combustion of carbon in fuel thus increase in concentration Carbon (ii) oxide

(b) It combines with haemoglobin to form carboxyhaeglobin which does not dissociate thus causing suffocation and it is colour less and orduorless.(3mks)

17. (a) $C_yH_{15}COO\text{-}Na+$ (1mk)

(b) Soapy detergent (1mk)

18. React aluminium sulphate with excess ammonium hydroxide to form aluminium hydroxide filter to obtain residue as Aluminium hydroxide then dry between the filter paper.

(3mks)

19. In C the CO2 react with Calcium hydroxide to form Calcium Carbonate is strong attracted .

(3mks)

20. (a) A- 2.8.1

B-2.1 (1mks)

(b) B because it is smaller in size therefore outermost electron is strongly attracted,

(2mks)

21. Region B because it has the lowest boiling point (2mks)

22. (i) No effect on the position of equilibrium because the number of mobs of gaseous on both sides of equilibrium are equal. (2mks)

(ii) Equilibrium position will shift from right to left backwards / more and steam are formed ,

(3mks)

23. (a) Is a solution / liquid / molten that decomposes when electric current passes through it.

(b) Because it is a metal therefore not decomposed by the current (3mks)

24.(a) (i) R,is a weak acid and dissociate ii Ionizes partly /sparingly . (1/2mk)

(ii) Q- is a strong acid and Ionizes / dissociates completely (1/2mk)

25. (i) x + 3(-2)=0

X=+6

Oxidation No of u = +6

(ii) HClO (1mk)

Oxidation No. of u =+1 (1mk)

26. (a) Cryolile is added (1mk)

(b) 3F = 96500 x3 = 289500

$Al^{3+}aq + 3e$ $Al_{(s)}$

Q=It = 40000 x 60x60= 144,000,000C

It 289500C= 27g

144000,000c =144,000,000x27/289500

= 13430.05g

=13.430kg (3mks)

27.(a) **B** because the quantity of solid B that dissolves is higher than B below 90^0c / solubility of A is lower than that of B from the graph below 90^0c .

(b) A crystals out since the solubility decreases with 30 – 10 =20g of A. No crystals of B are formed .

28. (a) lead Ions

(b) Zinc Ions

(c) $Zn^{2+}aq + 4NH_3aq$ $Zn\ (NH3)4^{2+}aq$.