CHEMISTRY

Form 4

Paper 1

MARKING SCHEME

1. [a] Bolyles law states that volume of a given mass of a gas inversely proportional to its pressure at constant temperature

[b] $P_1V_1=P_2V_2$

$\frac{560 \times 850}{640} = V_2$

$V_2=743.75\ cm^3$

2. [a] Magnesium oxide

[b] $Mg_{[s]} + N_2O_{[S]} \longrightarrow MgO + N_2[g]$

3. [a] -Manufacture of fizzy drink

-Used as a refrigerant

[any one correct]

[b] Marble chips [solid calcium carbonate and dilute hydrochloric acid (Any correct 2)

4 [a] Salty condition

Acidic condition

[b] -Addition of minerals to the soil

-decomposition of iron waste

5. 38g ⟶ 56g of water

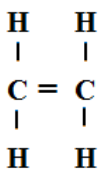
? ⟶ 100g of water

$\frac{35x\ 100}{56}$

= 67.85g/100g of water

6. Molten sodium chloride has mobile ions while solid sodium chloride does not have mobile ions

7 [a]



Propene

[b] Addition polymerization

[c] $\frac{[48]\ n}{48} = \frac{25620}{48}$

N=533.75 units

8.

[580 X1]+420X4 +[396]1 ⟶ [446]1 + [420 X5]+[438]1

580+1680 +396 ⟶ 446+2100+438

+ 2656 ⟶ -2984

+2656 −2984

=−328kJmol^{-1}

9 [a] Dynamic equilibrium is attained when the rate of the forward reaction is equal to that of the reverse reaction

[b] [i] The intensity of the yellow colour in the equilibrium mixture increased .

Additional of NaOH reduces the concentration ofH+ ions hence equilibrium shifts to the left

[ii] the intensity of the yellow colour in the equilibrium mixture decreases.

Additional of HCL increased the concentration of H+ ions hence equilibrium shifts to the right

10. [a] $Cu^{2+}[aq] + 2e^{-} \longrightarrow Cu[s]$

[b] Q= It

=1.5x150x60

=13,500C

2moles of electrons are depositing 1 mole of Cu metal

1 mole of electrons=96500C

2 moles of electrons =

193000C deposited 64g of copper

13500

$$\frac{13500 \times 64}{193000}$$

4.476g

11. [a] Half life of a radioactive isotope is the time taken for a given or number of nuclides to decay to half its original mass or number

[b] Alpha particle

Beta particles

[c] the number of half life $\frac{12}{3}$ =4

[1 /2]4x288=18g

12. E^{θ} = E RHS − E LHS

= − 1.64 − + 0.44

= −2.08V

The reaction will not take place because the e.m.f is negative

13 [a] Ethyne

[b] Calcium carbide and water

[c] Alkynes

14 [a] Rhombic sulphur

Monoclinic sulphur

[b] {i} Red brown gas of fumes were observed

{ii} $S_{[s]} + 6HNO_{3[aq]} \longrightarrow H_2SO_{4[aq]} + 6NO_{2[g]} + 2H_2O$

15 [a] Acts as a bleaching agent

[b] $2Ca[OH]_{2[aq]} + Cl_{2[g]} \longrightarrow CaCl_{2[aq]} + Ca(OCl)_{2\{aq\}} + 2H_{[g]}$

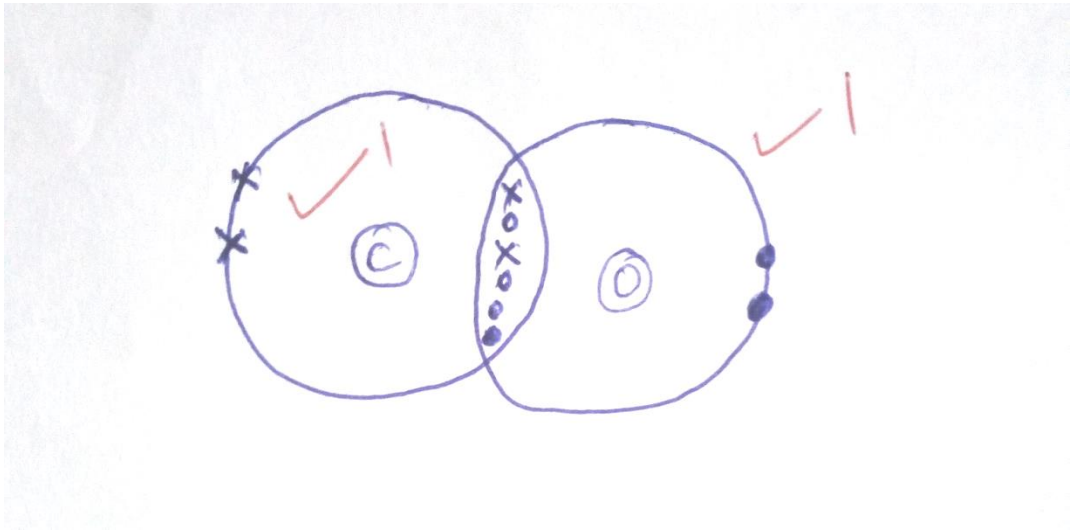
16. [a] Ester

[b] propanol and methanoic acid

[C] Concentrated sulphuric {IV}acid catalyst

Warming

17.



18. Mass of carbon

$= \frac{12}{44}$ x 29.3

Mass of H $= \frac{2}{18}$ x11.7= 7.99

=7.99

Mass of O_2

20 –[7.99+1.3] =10.71

Element	C	H	O
Mass of the element	7.99	1.30	10.71
R.A.M	12	1	16
Divide by R.A.M	7.99 / 12	1.30 / 1	10.71 / 16
Divide by smallest value	0.6658 / 0.6658	1.3 / 0.6658	0.6693 / 0.6658
	1	1.95	1.005
Mole ratio	1	2	1

E.F CH_2O

19. [a] White precipitate was formed

[b] $Pb_{2[q]}$ + 2Cl [aq] ⟶ PbCl2[s]

20 [a] hydrogen

[b] Electrolysis of brine

Cracking of larger alkanes

[c] Finely divided iron

Plantinum catalyst

[d] Manufacture of nitrogen fertilizer

Used as a refrigerant

Softening of water

21 [a] Upward delivery

[b] gas x is denser than gas y

[c] Hydrogen, ammonia,methane

22.x+4 x 36x x +40+4=37.25 x [x + 4]

36x + 160 = 37.25x +149

36x – 37,25x=149 – 160

-1.25x=+11

-1.25 =1.25

X=8.8

23. A liquid is boiled when constant boiling point is maintained the liquid is pure

24.

$$\frac{Time\ in\ T}{Time\ in\ R} = \frac{\sqrt{Density\ T}}{\sqrt{Density\ R}}$$

$$\frac{48\ sec}{70\ sec} = \frac{\sqrt{0.16}}{\sqrt{Density\ R}}$$

$$\left(\frac{48\ sec}{70\ sec}\right)^2 = \left(\frac{\sqrt{0.16}}{\sqrt{Density\ R}}\right)^2$$

$$\frac{2304}{4900} = \frac{0.16}{Density\ of\ R}$$

$$Density\ of\ R = 0.3402\ g/cm^3$$

25. {a}E

{b} A

{c} C