MARKING SCHEME

233/1

CHEMISTRY

PAPER 1

THEORY

1. (a) K 2. 8.8.2 √*1mk*

M 2.6 √*1mk*

(b) K 2+

M 2-

2 (a) Anode: I- (l) I2 (g) + 2e- √*1mk*

Cathode: Pb2+ + 2e- Pb (s) √*1mk*

b) Increase in temperature increases the kinetic energy (1/2 mrk) of positive centres and electrons making them to vibrate more. These increase collisions of positive centres and electrons hence increased resistance (1/2mrk)

3. Add water to the mixture and stir sodium chloride dissolve leaving copper (ii) oxide which is insoluble. (√*1mk* )

Filter (1/2) to remove copper (ii) oxide and sodium chloride as the filtrate

Evaporate the filtrate to saturation and cool to obtain sodium crystals (√*1mk* )

Dry them between filter papers/leave them in the open to dry (√*1mk* )

1. Hot platinum wire glows red. (√*1mk* )

Brown fumes are observed (√*1mk* )

Reaction between oxygen gas and ammonia gas over platinum wire is exothermic. (1/2mrk)

Ammonia is oxidized to nitrogen (ii) oxide which reacts with excess oxygen to form nitrogen (iv) oxide,(1/2 mrk)

5. a) A bond formed by two atoms/elements by share of electrons from one of the atoms/element(√*1mk)*

b)

6. a) Remove / absorb carbon (iV) oxide (√*1mk* )

b) 3Mg (s) + N2 (g) Mg3N2 (s) (√*1mk* )

c) Neon/ Argon (√*1mk* )

7. a) But – 1 – ene (√*1mk* )

b) Pent – 2 –ene (√*1mk* )

c) Potassium manganate (VII) is decolourised/ Potassium manganate (VII) changes colour from purple to colourless (√*1mk* )

8. a) The outer zone has complete combustion and hence hotter tha the middle zone forming the charred black part (1mrk) Middle zone has incomplete combustion and hence less hot forming unburnt part (√*1mk* )

b) - Non – luminous flame is hotter than luminous flame (1mrk)

Non – luminous flame does not produce soot (1mrk) Any one (√*1mk* )

9. a) Sulphuric (VI) acid react with marble (Calcium carbonate) forming insoluble calcium sulphate(1mrk) which form a coat over marble stopping any further reaction (√*1mk* )

b) Oil is less dense (1/2) than water making oil float(1/2) on top hence continues to burn.

10. 2XOH(aq) + H2SO4(aq) X2SO4 (aq) + 2 H2O(l)

XOH = 2 = 15 X M

H2SO4 1 20 X 0.045 (√*1mk*)

M = 2 X 20 X 0.045

1 X 15 = 0,12 moles/l (1/2)

1mole = 2.88

0.12 = 24 (1/2)

RFM of XOH = X + 16 + 1 (1/2)

X = 7 1/2)

11. a) 2CxHy X CO2 + y/2 H2O

X = 6

2 = 3 (1/2)

Y = 12

3 = 6 (1/2)

MF = C3H6 (1/2)

Structural fprmula = CH3 CH = CH2 (1/2)

b) Alkenes

12. on the diagram

a) √*1mk*

b) arrow from zinc half-cell towards copper half cell √*1mk*

c) Zn(s) + Cu2+(aq) Zn2+(aq) + Cu(s) √*1mk*

13. (i) Froath floatation √*1mk*

(ii) Concetrating the mineral ore by making impurities to sink atb the bottom. √*1mk*

14. (a) Exp. 1 – The colour of dry cloth did not turn to white/ cloth not bleached, because of the absence of hypochloric (I) acid which is responsible for bleaching

(b) Exp 2 – Wet cloth turned white due to bleaching as chlorine dissolves in water to form hypochloric(I) acid√*1mk*

b) Cl2(g) + H2O(g) + Dye {Dye + [O]} + 2HCl(g) √*1mk*

15. (a) Solubility is the maximum mass in grams of solute that will dissolve in 100g ofvwater at a given temperature/ is the mass in grams of solute required to make a saturated solution with 100g of water at given temperature. √*1mk/*

(b) Mass of solid Y = 30.4 – 26.2

= 4.2g (1/2mrk)

Mass of water in the solution = 42.4 – 30.4

= 12g (1/2 mrk)

12 g of water dissolve 4.2g solid Y

100g of ware will dissolve 100 x 4.2 (1/2mrk)

12

= 35g / 100g of water (1/2mrk)

16. AH0f(CO) + AH0c(CO) = AH0c(C)

-105 + AH0c(CO) = -393 √*1mk*

AH0c(CO) = -393 + 105 √*1mk*

= -188kJMol-1 √*1mk*

17. a) Water √*1mk*

b) The delivery tube should first be removed √*1mk* to avoid sucking back of liquid M √*1mk*

18. a) Atomic mass of Y 2 + 3 = a + 1

a = 4 √*1mk*

Atomic number 1 + 1 = b + 0

b = 2 √*1mk*

b) Nuclear fusion √*1mk)*

19.

V1 = 4dm3 ; P1 = 152mmHg ; V2 = 2dm3 ; T1 = 250K ; T2 = 500K P2 = ?

152 x 4 = P2 x 2

250 500 √*1mk*

P2 = 152 x4 x 500

250 x 2 √*1mk*

= 608mmHg √*1mk*

20. a) (i) Liquid H is Water √*1mk*

(ii) Gas G is Nitrogen (i) oxide √*1mk*

b) turn white anhydrous copper (II) sulphate to blue / Turns blue cobalt(II) chloride to pink √*1mk*

21. a) Amphoteric oxide √*1mk*

b) Lead (II) oxide / Zinc oxide / Aluminium (III) oxide (Any one) √*1mk*

22. a) Rate of forward reaction equals to the rate of backward reaction. √*1mk*

b) Orange colour of the solution intensifies √*1mk*

Equilibrium shift to the left/ backward reaction is favoured to replace OH- that react with H+ √*1mk*

23.

Element Ba S O

% composition 58.81 13.72 24.47

RAM 137 32 16

No. of moles 58.81 13.72 24.47 (1/2mrk)

137 32 16

0.4293 0.4281 1.768

Mole ratio 1 1 4 (1/2mrk)

E . F. BaSO4 (√*1mk)*

24. (i) A white ring/ solid (1/2mrk) was formed inside the combustion tube closer to the cotton wool soaked in concentrated hydrochloric acid (1/2mrk). Ammonia is lighter/less dense than hydrochloric acid hence diffuse faster ( √*1mk)*

(ii) NH3 (g) + HCl(g) NH4Cl(s) (√*1mk)*

25. (i) The yield of AB is increased. (√*1mk)*

The forward reaction is accompanied by a decrease in volume(1/2mrk). Equilibrium shifts to the right following increase of the forward reaction (1/2mrk)

(ii) The yield of AB is increased’ (√*1mk)*

The forward reaction is exothermic.(1/2mrk) Decrease in temperature favours the forward reaction, equilibrium shifts to the right.(1/2mrk)

26. (a) Deliquescence (√*1mk)*

(b) Efflorescence (√*1mk)*

(c) Hygroscopy (√*1mk)*

27. a) A – Nitrogen (IV) oxide/ NO2 (√*1mk*)

B – Oxgygen/ O2 (√*1mk*)

b) 2ZnNO3 (g) 2ZnO(s) + 4 NO2 (g) + O2(g) (√*1mk*)

28. Tin (√*1mk*)