**FORM 3 CHEMISTRY PAPER 2 MARKING SCHEME**

1. (a) (i) C = 2.8 🗸½

 F = 2.8.8 🗸½

1. Period 3 🗸½

 Group II 🗸½

1. B has a giant metallic structure🗸½ with strong metallic bonds🗸½ hence B.P very high compared to F which has

 molecular structure🗸½ with weak van der Waal forces🗸½ between the molecules hence low B.P.

1. BG2🗸¹
2. Chloride of A is ionic has strong ionic 🗸½ bonds hence high B.P.While C has molecular 🗸½ structure with weak van der

Waal forces 🗸½ hence low B.P.

 (e) A2O 🗸½ C2O3🗸½ DO2🗸½ G2O7🗸½/G2O

(f) C2O3🗸½ its amphoteric 🗸½

(g) +4 🗸¹

(h)

 🗸¹🗸¹



**2 A** a) white precipitate forms

**b)**  Ca(OH)2 + CO2 Ca(CO)3 + H2O

**B i)** P4 + 5 O2 5 P2O5

 **ii)** The oxide dissolves forming phosphorus acid🗸¹

 **C** aluminum reacts with air forming a protective coat of aluminum oxide which prevents further corrosion🗸¹🗸¹

 D (a Sodium peroxide 🗸¹

 (b)

1. 2Na2O2(S) + 2H2O(l)→ 4NaOH(aq) + O2(g) 🗸

3. (i) the rate of diffusion of a gas is inversely proportions to the squareroot of its density provided the initial conditions remain constant.

(ii) TQ = MQ

 TO2 MO2

TQ =12.6 sec

TO2 =22.4 sec

MO2=2 X 16=32

12.6 = MQ

22.4 32

MQ=12.6 X 32

 22.4

10cm3 of O2 11.2 Sec

20cm3 of O2

20cm3 x 11.2 =22.4 sec

 10cm3

10.13

(iii) P1V1 = P2 V2

T1 T2

P1 =100000PA

V1 =250dm3

T1 =25 = 273=298K

P2=80,000 Pa

V2=400dm3

T2=?

100000 x 250 =80,000 x 400

 298 T2

T2= 298 X 80,000 X 400 =381.44

 100,000 X 250

=108.44O  C

b. (i) It is the simplest formula of a compound which express its composition by mass.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| element  | CU | S | O | H2O |
| Composition by mass  | 25.4 | 12.8 | 25.8 | 36 |
| R.A.M | 63.5 | 32 | 16 | 18 |
| Moles  | 25.4=0.463.4 | 128=0.432 | 25.6=1.616 | 36=218 |
| Divide with smallest | 0.4=10.4 | 0.4=10.4 | 1.6=40.4 |  2 =50.4 |
| Ratio | 1 | 1 | 4 | 5 |

E.F. is CuSO4  .5 H2O

(ii) No of moles of hydrated salt =9.98 =0.04

 249.5

0.04 moles 200cm3

? 100cm3

0.04 x 1000cm3

 200cm3 =0.2m

C. 2CO (g) + O2(g) 2CO2 (g)

 2vol 1vol 3vol

2 vol 200cm3

1 vol 100cm3

O2 150cm3

Final composition 50cm3 of O2

200cm3 of CO

4.a Take 2 tablets after every 8 hours for 3 days 🗸¹

 b) Produced when the air hole is open. 🗸¹

 c) Difference in densities. 🗸¹

They are immiscible. 🗸¹

 d) i) fractional distillation🗸¹

 ii) heating should be gentle because benzene is volatile🗸¹

e) sodium hydrogen carbonate is ba🗸¹sic it neutralizes the acid🗸¹ic bee sting

**(f)** (i) Q🗸¹

 (ii) Pink/Red🗸¹

5. (i) CO2 is collected by downward delivery.

-exchange apparatus containing water and concentrated sulphuric (vi) acid.

-used dilute hydrochloric acid for dilute sulphuric (vi) acid. For any two (2mks)

B(i) M –Ammonia gas

 Q-carbon (iv) oxide. (2mks)

(ii) F-Ammonium chloride

X- Sodium hydrogen carbonate (2mks)

(iii) L-Calcium Chloride

-used as drying agent

-used in extraction of sodium as impurity to lower melting point.

-It can be electrolysed to obtain calcium

(iv) Tower p-NH3 (aq) + CO2 (g) +Naclaq) + H2O(L) NaHCO3(S) + NH4CL(aq)

Chamber K

Ca (OH) 2 + 2NH4CL (aq) CaCl2 (aq) + 2NH3 + 2H2O(L)

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Chamber K

Ca (OH) 2 + 2NH4CL (aq) CaCl2 (aq) + 2NH3 + 2H2O(L)

**6 A**

* Heat to sublime NH4Cl. 🗸½
* Add water 🗸½ to dissolve NaCl. 🗸½
* Filter 🗸½ the residue is PbCl2🗸½
* Evaporate 🗸½ the filtrate (NaCl solution) to obtain NaCl solid.

b) 2 NaNO3 2 NaNO2 + O2🗸¹

2Cu(NO3)2 2CuO + 4 NO2 + O2🗸¹

CaCO3 CaO + CO2🗸¹

(iii) A substance which absorbs moisture from atmosphere and dissolves in it🗸¹

 Anhydrous calcium chloride, zinc chloride, sodium hydroxide pellets, potassium hydroxide pellets.

6. B. (i) it is the decomposition of a compound by passing an electric current through it.(1mk)

(ii) D2+ (l) + 2e D e (1mk)

(iii) Bromine fumes produces is poisonous. (1mk)

(iv) Used in Electroplating

-used in purification of metals.

-used in extraction of metals. Any 1mk.

7(a)



(ii) Zn(s) + 2HCL(aq)) ZnCl2 (aq) + H2(g)

b (i) The black solid turned to a brown solid.(1mk)

Hydrogen gas reduces copper (ii0 oxide to copper which is brown.(1mk)

(ii) CuO(S) + H2 (g) CU(S) + H2O(L) (1mk)

(c) (i) water (1/2mk)

(ii) Add a drop of x to anhydrous copper (II) sulphate white )changes to blue hydrated copper (II) sulphate.(1mk)

Add a drop of x to anhydrous cobalt chloride paper (blue) change to pink hydrated cobalt chloride.(1mk) (Any)

D(i) Hydrogen is below Magnesium in the reactivity series hence cannot reduce magnesium oxide to form water Hydrogen  has a lower affinity for combined oxygen hence cannot remove oxygen from magnesium oxide.

(ii) 2H2(g) + O2 (g) 2H2O(L) (1mk)