**FORM FOUR END TERM 2 - PAPER 2 MARKING SCHEME**

 **CHEMISTRY FORM 4.**

1. (a) (i) A

 (ii) -0.44- -0.76{ ½ )

 =0.32V { ½ )

 (iii)

 A B,E NB/ all 1mk, any 2 ½

 (iv)



 (b) (i)

 2H(aq)++2e$\rightarrow $H2(g

 (ii)Introduce a glowing splint and it will relight.

 (c) Mass deposited=QRAM/FC

 Let charge be C

 1.9=[0.6x1.5x60x60] x113/[96500\*C]

 C=[0.6x1.5x60x60x113]/[1.9x96500]

 C=1.9968 or ~ +2

**OR**

 **Q= IT**

 **0.6X1.5X60X60=3240**

 **If 3240=1.9g**

 **? =113**

 **[3240X113]/1.9=192694.73c**

 **192694/96500=1.9968**

**~+2**

**2.(a)**

* **Haematite**
* Magnetite

**(b) reaction of coke with oxygen is highly exothermic**

**(c)**

* Low density.
* Immiscible with iron.

**(d) CO2 + C ……… 2CO**

 **(e) 2Fe2O3 + 3C ……….4Fe + 3CO2**

**f) cast iron is used to make manhole covers**

**used as a catalyst in harber process**

**making cutlery and surgical equipments**

**(g) SO2 causes acidic rain**

**CO2 Causes global warming**

 **(h)**(i) It would decrease{1mks},increase in temperature favours endothermic reactions ½ and therefore reverse reaction is favoured ½

(ii)Vanadium (iv) oxide ~**reject platinum.**

 (iii Manufacture of dyes{1/2mks}

Filling batteries{1/2mks}

**Any other correct answer**

**3.**(a)(i)A 2,8,1

D 2,8,7

 (II)



 (b)**Yshown in the table,period4 group vi**

 (c)(i)C is more reactive than A{1mks}

C has a larger atomic radius/lower ionization energy and therefore easily loose the outer most electron{1mks}

 (ii)

A has a larger atomic radius than B /B has a shorter atomic radius than A[{1mks}B has more protons than A and therefore energy level attracted strongly towards the nucleus.{!mks}

(iii)Oxide of G has the higher melting point than the oxide of D.{1mks} Because oxide of G has a giant ionic structure with strong ionic bond while oxide of D has simple molecular structure with weak van der waals forces.{1mks}

**(c) 2**Na +2HCl $\rightarrow $ 2NaCl +H2 1mk

Moles of A =

0.92/23 ( ½ )

 =0.04moles

Mole ratio

2 : 1

Moles of hydrogen

 0.04/2

 = 0.02 ( ½ )

Volume of hydrogen

0.02 X24 = 0.48dm3 or 480cm3

**4.**(a) The reaction would start and then stop immediately {1mks}

Because calcium sulphate formed is insoluble and therefore forms a coating on calcium preventing further reaction ( 1mk)

 (b)(i)Add a sample to;

White anhydrous **copper (ii) sulphate**, it would turn to blue.

**OR**

Blue anhydrous **cobalt (ii) chloride**, it would to pink.

**NB/ REAGENT 1MK, CORRECT COLOUR CHANGES 1MK**

(ii) Boil ½ , If it boils at a **constant/fixed** temperature. ½ **REJ 1000 C**

 (c) (i) Mg(s) + H2O(g) $\rightarrow $ MgO(s)  + H2(g)

 (ii)It is less dense than air.

**5.**(a) MnO2(s) +4HCl(aq) $\rightarrow $ MnCl2(aq) + Cl(g) +2H2O(l)

 (b)

* It turns red then white{1mks}
* Red because the solution is acidic{1mks}
* White because the **HOCl** bleaches the dye in the litmus{1mks}

(c) sodium chlorate

 (d) I) (i) To expel the air that was inside so that its oxygen doesn’t react with chlorine.

 (ii) It would absorb both water moisture and un-reacted chlorine.

 II) moles of chlorine gas=4000$/$24000

= 0.16677moles

 2Fe + 3Cl2$\rightarrow $ 2FeCl3 {1mks}

 Mole ratio

 Cl2 : FeCl3

 3 : 2

 Moles of product

 If 3$\rightarrow $0.1667

 2$\rightarrow ?$

 2$×$0.1667/3

 =0.11111moles

 Mass of product=moles $×$ RMM

 0.11111$×$162.5

 =18.0538g

**6.** (a) It is the spontaneous disentigration of an unstable nuclide to form a stable nuclide.

 (b) (i) Step (I) Alpha $α$

 Step (ix) Beta$ β$

 (ii) 90230Th $\rightarrow $88226Ra + 24He

 (iii) 30/6 = 5

 48$\rightarrow $24$\rightarrow $12 ----- 6$\rightarrow $3$\rightarrow $1.5g

 =1.5g

 (c).

**7.** (a) 

 (b)(i) 240 - value at 50 {1mks} Answer {1mks}

 (ii) value to be read from the gragh.

 (c) Because 1g of calcium carbonate can only produce 240cm3(1mk)

 That is 1/100 = 0.01 (½ )

Moles of CO2

 CaCO3 ;CO2

 1 : 1

 0.01$×2400$0

 =240cm3

 (d) Tangent at 55th minute (1MK)

Dy/dx {1mks}

* Answer with units {1mks}
* Answer with no units{1/2mks}
1. Use powdered calcium carbonate.

Warm the acid.

**8.** (i) Cu(NO3)2(aq) + Na2CO3(aq) $\rightarrow $CuCO3(S) +2NaNO3(aq).{1mks}

(ii) A blue precipitate, ½ Insoluble in excess.{ ½ mks}

(iii) Brown copper solid dissolves forming a blue solution.

 Brown fumes are seen escaping.

 (iv) Cu(aq)+2 +2OH(aq) -$\rightarrow $Cu(OH)2

Cu(OH)2(S) + 4NH3(aq)$\rightarrow $[Cu(NH3)4](aq)+2 +2OH-(aq)

V) To clean metals.

 Manufacture of nitrogeneous fertilizers

 **Any other relevant**