SET 4

MARKING SCHEME CHEMISTRY F2

1(a) (i). green yellow

(ii). Soluble

(iii).shiny dark grey solid

(b).(i). *MnO2(S) + 4HCl(l)  MnCl2(aq) + Cl2(g) +2 H2O(L)*

(ii). To oxidize HCl into chlorine gas

(iii). KMnO4 is a stronger oxidizing agent, it easily oxidizes HCl into chlorine gas.

IV).- economical since heating is not required

-production of chlorine gas can easily be controlled

(v). iron (III) chloride/ FeCl3

(vi). *3* *Cl2(g) +2 Fe(s) 2FeCl3(s)*

*(c(i)).*  hydrogen gas

(ii). *Ca(s) + 2 H2O(l) Ca(OH)2(aq) + H2(g)*

(iii). The calcium hydroxide formed is slightly soluble. Only a few *OH-* are produced.

(iv). Calcium hydroxide is used to tes the presence of carbon (IV) oxide gas.

2.(a).-sodium continues to burn with a white flame.

-a white solid substance is formed.

(ii) *Na(s) + Cl2(g) NaCl(s)*

*(*iii) used as food additive.

(b)(i). –grey solid observed.

-Droplets of colourless liquid.

(ii). *H2(g) + PbO(s) H2O(l) + Pb(s)*

(iii). –Reducing property/ reducing agent.

(iv). For activation energy and to speed up the reaction.

3.(i). oxygen gas/ O2

(ii). The PH would reduce. The unstable chloric (I) acid decomposes into acidic HCl.

(iii). The unstable yellow chloric (I) acid decomposes into oxygen and colourless HCl

(iv). *2HOCl(aq)*   *sunlight 2HCl(aq) +O2(g)*

(v). it turns red and then bleached (colorless). *It turns red*  due to the acidic HCl. The dye in the litmus paper combines wih the nacent oxygen atom from the unstable chloric (I0 acid hence bleached.

(vi). *HOCl(aq) + dye(coloured) dye+O bleached) +HCl(aq)*

(vii)- manufacture plastics eg PVC

-water treatment

-manufacture bleaches used in paper industries (accept any other correct use)

4(a)(i).

X

(ii) I. transition metals. II. Non metals.

(b)(i). *MgCl2 (ignore state symbols;accept correct equation)*

I. Harmfull substance released into the environment.

II.Soot is produced when hydrocarbons burn in limited supply of oxygen.

(iii).I. Used to absorb carbon (iv) gas from the air.

II. Used to absorb moisture from the air.

(b). at A. *2* *H2(l) + O2(g) 2H2O(l)*

*At B. Zn(s) + 2HCl(aq) ZnCl2(aq) + H2(g)*

(ii)(a). – to drive away the air initially in the tube to avoid oxidation of hot magnesium.

* To produce steam to react with heated magnesium.

(b). K- hydrogen gas/*H2*

*(C)*. It is less dense than air

(d). *H2O(g) + Mg(s) MgO(S) + H2(g)*

(e) .a. Upward delivery/ downward displacement of air.

b. Downward delivery/upward displacement of air.

(ii). Method (b). carbon (iv) oxide is denser than air.

5. (a). curve B. pure substances have sharp melting and boiling points.

(b). Impurities lower the melting points but raises the boiling points. Of substances.

(c).-Hydrogen; acetylene/ ethyne.

6.(i) Moist iron

Test tube

water

(ii). Their colour changed from grey to red brown. They reacted with moisture/water and air to form rust.

(iii). Rusting destroys appearance of materials.. it also weakens them.

(iv).cool to -2000c and carry out fractional distillation to obtain nitrogen.

(v). lime raises the soil PH/reduces the acidity of the soil/.