**FORM 2**

**CHEM MARKING SCHEME**

**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 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 with 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/.**