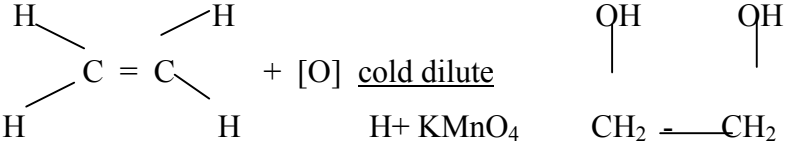
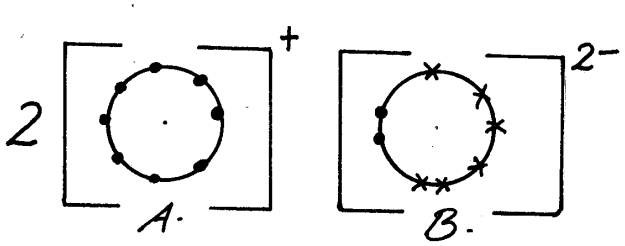
SAMPLE PAPER 2

MARKING SCHEME

233/1

1	a) Name - Froth Flotation ✓ ½ Use - To concentrate the Ore b) $2\ CuFeS_{2(s)} + 4\ O_{2(g)} \rightarrow Cu_2S_{(s)} + 2\ FeO_{(s)} + 3SO_{2(g)}$ c) - Making ornaments - Electrical wires - Coins - Pipes
2	a) Moles of acid = $\frac{100}{1000}$ x 1 = 0.1 moles✓ Moles of carbonate $\frac{4.2}{84}$ = 0.05✓ Hcl is in excess by 0.05✓ b) Moles of $Co_{2(s)} \longrightarrow$ 0.05 volume of CO_2 =24 x 0.05 = 1.2 dm^3
3	a) The volume a fixed mass of gas is inversely proportional to its pressure at constant temperature - Particles of a gas are widely spaced hence can be compressed b) Low pressure High temperature
4	a) (i) Butanoic acid (ii) Propylethanoate b) 

5	a) D, has the weakest nuclear charge compared to the other non metal b) B – the ion of B has stronger nuclear charge attraction for two energy level than that of A
6	a) (i) K (ii) J c) NH_4^+ Proton donor
7	a) X - Fractionating column Y - Liebic condenser b) to condense back the component of higher boiling point c) shown on the diagram d) fractional distillation
8	a) They have a higher nuclear charge hence electrons are firmly held/more energy needed to lose the valence electrons than in group 1 b) Down group 1 atomic size increases while nuclear attraction reduces hence ease of electron loss while down group 7 increased atomic size reduces the attraction for the incoming electrons / tendency to repel incoming electron increases down the group ?
9	a) Add $NH_{3\,(aq)}$ / $NaOH_{(aq)}$ Zn^{2+} - white ppte soluble in excess Fe^{2+} - dirty green ppte insoluble in excess b) Add a cidified $K_2\ C_2\ O_7$ of CO^{2}_{3} no effect SO^{2}_{3} - changes colour of $K_2\ Cr_{2v}\ O_7$ from orange to green v CO^{2}_{3} - no effects SO^{2}_{3} - $KMnO_4$ decolourized

10	a) A_2B 
11	a) W - Conc hydrochloric acid Y – Conc sulphuric acid b) Not necessary - $KMnO_4$ is stronger oxidizing agent than MnO_2 c) Remove traces of HCL fumes
12	- Pass the gases through lime water separately - Carbon (iv) Oxide form white ppte - carbon (ii) oxide want forms ppte
13	a) Reaction carried out in a closed system or vessel b) Increase in temperature - Reduction in pressure
14	Moles of acide = $\frac{18 \times 0.22}{1000}$ Moles of carbon $\frac{1}{2} \times 18 \times 0.22$)

	1000 concentration of carbon = 18 x 0.22 x 1000 2000 25 0.0792 mass in 200 cm^3= molar mass x vol in litre x concentration 138 x 200 x 0.0792 1000
15	a) Neutron to proton ratio Amount of energy released b) a = 2, b = 2
16	- Bubbles of a gas at the a node - Brown deposits at the cathode - Blue colour of solution fade b) 1 or 2
17	a) M – colorless liquid condenses/ colourless gas condensed to colourless liquid N - White ppte formed b) at M - water (H_2 O) N – carbon (iv) oxide (CO_2)
18	Mass of hydrated salt = 305 – 300 = 5g Mass of dehydrated salt = 302.2 - 300 = 3.2 g Mass of water of crystallization 5 – 3.2 – 1.8g $CUSO_4$: H_2 O 3.2 : 1.8 159.5 : 18 0.02 : 0.1 1 : 5 E.F. = $CUSO_4$ 5 H_2 O or

	Mass of water of crystallization $\underline{18x}$ Mass of dyhydrated salt 159.5 $\frac{1.8}{3.2} = \frac{18x}{159.5}$ $x = \frac{1.8 \times 159.5}{3.2 \times 18} = 5$ $CUSO_4 \ 5 H_2 O$
19	$H^+_{aq} + OH^-_{aq} \longrightarrow H_2O_l$
20	a) - air is compressed to a pressure of 200 atmosphere repeated compression andexpansion of air cools it to a liquid when its temperature falls to -200^o C b) CO_2 would turn to solid in the pipes and this causes blockages of the pipe
21	(i) It turns red litmus paper blue and has no effect on blue litmus papers (ii) Magnesium nitride (iii) $Mg_3N_{2(s)} + 6H_2O_{11} \rightarrow 3Mg(OH)_{2(s)} + 2NH_{2(gs)}$
22	a) two half of the same element have O potential or copper is the reference electrode b) weakest oxidizing is K weakest reducing is Ag+ c) 0.79 - (- 2. 75) =+ 3.54V
23	a) $\Delta_1 H_1$ heat of atomization of sodium $\Delta_2 H_2$ heat of ionization of sodium $\Delta_1 H$ lattice energy of sodium chloride b) 434 + 371 + 483 - 781=507
24	a) Tripple bond in the molecule requires a lot of energy to break, making nitrogen relatively more chemically stable - Nitrogen forms a stable ion by gaining three electrons and gain of 2nd and

	3^{rd} electron require a lot of energy b) Nitrogen has low boiling point (-196º C
25.	a) J. conducts electricity in both solid and liquid state b) Giant covalent structure - doesn't conduct electricity and has high M.P and B.P
26	a) Halogens b) K is more reactive than L K loses one electron while L losses 2 hence more energy required P_2 Q_3
27	a) Sulphur has allotrophes with different melting points b) Its high temperature (170º - 180º C)melts the sulphur which melts at 113º C – 119º C - Its high pressure of 10 atom help to force molten sulphur out of the deposits to the surface c)
28	Soap less detergent