**233/2**

**CHEMISTRY**

**PAPER 2**

**MARKING SCHEME.**

1. a) Structural formula of ethanol

H H



H - C - C - O - H 1



H H

b) Concentrated sulphuric (vi) acid is a dehydrating agent 1

c) i) The sand bath helps in distributing  ½ the heat equally at the bottom of

the flask.

ii) Porcelain or sand catalyse ½ the decomposition of the alkanol and

ensure that the mixture 1 boils smoothly.

1. Aluminium Oxide or  ½ Phosphoric (v) 1 acid can also dehydrate alkanol to form alkenes.
2. CH3CH2 OH H2SO4 170 CH2 = CH2(g) + H2 O(l)St1 bal 1 
3. i) The gas ethane, decolourises bromine water1

CH2 = CH2 + Br2 CH2  - CH2



Br Br

***Or***

CH2 = CH2 + HOBr CH2 - CH2  



OH Br

h)

2. a) Copper iron sulphide / Copper pyrites

b) i) Sulphur (IV) Oxide SO2 ( 1mk

ii) Iron (II) Silicate, FeSiO3 ( 1mk)

c) 2 Cu2S(s) + 3O2(g) Cu2O + SO2(g) 1mk

d) - Connect the impure copper to anode (+ve) terminal of battery and a pure

copper metal to cathode (-ve terminal) ½ mk

* Insert the metal in a copper (II) salt solution
* Switch on the current  ½ for a reasonable period
* Pure metal deposits at cathode as anode dissolves
* Switch off current and remove your pure copper metal.

e) Cu2+ + 2e Cu

64g of copper = 2 x 96500c

24000g = ?

= 2 x 96500 x 24000

64

= 72375000c 1 mk

But c = I x t

72375000 = 8 x t

T = 72375000 hrs  1mk

8 x 3600

= 2513 hrs  1mk

Uses of copper

* Coinage
* Copper wires for electric transmission
* Electroplating for decorative, prevention and ornamental work
* Making alloys e.g. bronze.

3. a)i) Hydrogen sulphide reduces Conc. H2SO4 and itself is oxidized to sulphur

ii) anhydrous calcium Chloride 1 mk

1. A yellow solid of sulphur  1mk
2. 2H2S(g) + O2(g) 2S(s) + 2H2O(g)

Penalise fully for not B.E

Penalize ½ mk for not S.S

1. - It is a reducing agent

- It is denser than air any 2 – 1 mk each

- Burns in air

1. Prepared in fume cupboards,  1 mk hydrogen sulphide is poisonous. 1mk
2. Yellow deposit of sulphure is formed  ½ mk

Sulphur (IV) Oxide acts as an oxidizing agent  1mk, hence supplying oxygen to hydrogen sulphide which becomes reduced  ½ mk

**Total 11 mks**

**4. a) i)** H2SO4  should not be used to prepare CO2  became if forms soluble coating

of calcium sulphide which prevents for their reaction  1.

1. The gas jar should not be corked because no gas will be collected
2. Conc sulphuric acid  1
3. To absorb or remove hydrogen Chloride fumes  1mk
4. Used fire extinguisher  1
5. a) N – Sodium Carbonate / ½

E – Ammonium Chloride /  ½

b) NH3 + Cu2(g) + H2O(l) + Nacl(aq) NaHCO3(s) + NHCl(aq) Bel ff- l

c) Reaction at carbinator is highly exothermical produces a lot of heat energy

d) - Manufacture of glass, dye soap

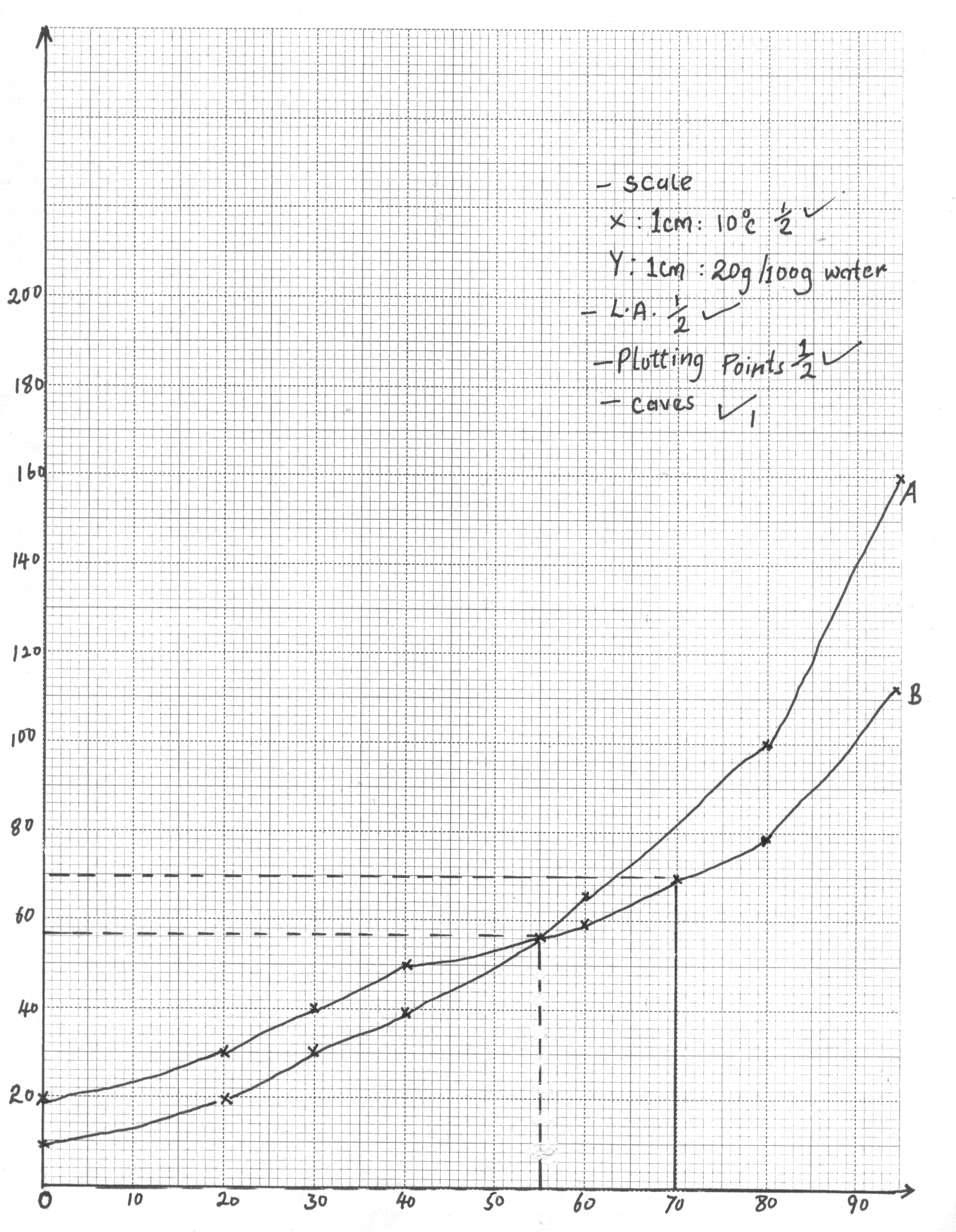
- Water softening

- Manufacture of sodium silicate used in manufacture of detergents

e) i) Calcium Chloride 1

ii) Used an extraction of sodium metal  Any one

- Used as a drying agent  1mk



***Temperature C***

5. a) ii) 70C 1

iii) Solubility at 100 = 68

Solubility at 30 = 40  1

Mass deposited = **20g 1**

iv) 54.5C ½

1. Solubility of both salt at 54.5C

Is 57 g  ½

Total Mass solution is= 57 + 100 ½

= 157g ½ 2mks

b) i) A CuSO4 , because the solubility at 35C

is lower than solubility at 70C

1. 38 – 38 = 10g
2. Pb(NO3)2
3. 79 – 78 = 1g

**6. a)** Mixture of a solubleand insoluble salt 1mk

**b)** solid U– lead Carbonate 1mk

**gas v - Carbon (IV) Oxide** 1mk

Solution W – Lead nitrale 1mk

Precipitate R – Lead Chloride 1mk

c) Zn2+  ½and SO42-  ½ 1mk

d)i) Ba2+ + SO42- BaSO4  1mk

ii) Pb2+(aq) + 2Cl(aq) PbCl2(s) PbCl2(s)

iii) Mixture x = ZnSO4(s)  and PbCO3(s)  2mks

7. a) i) A and E ½ mks

ii) B,C, D (All) ½ mk

b) i) D;

Its boiling point is less than 25C or 298 K 1mk

ii) D 1mk

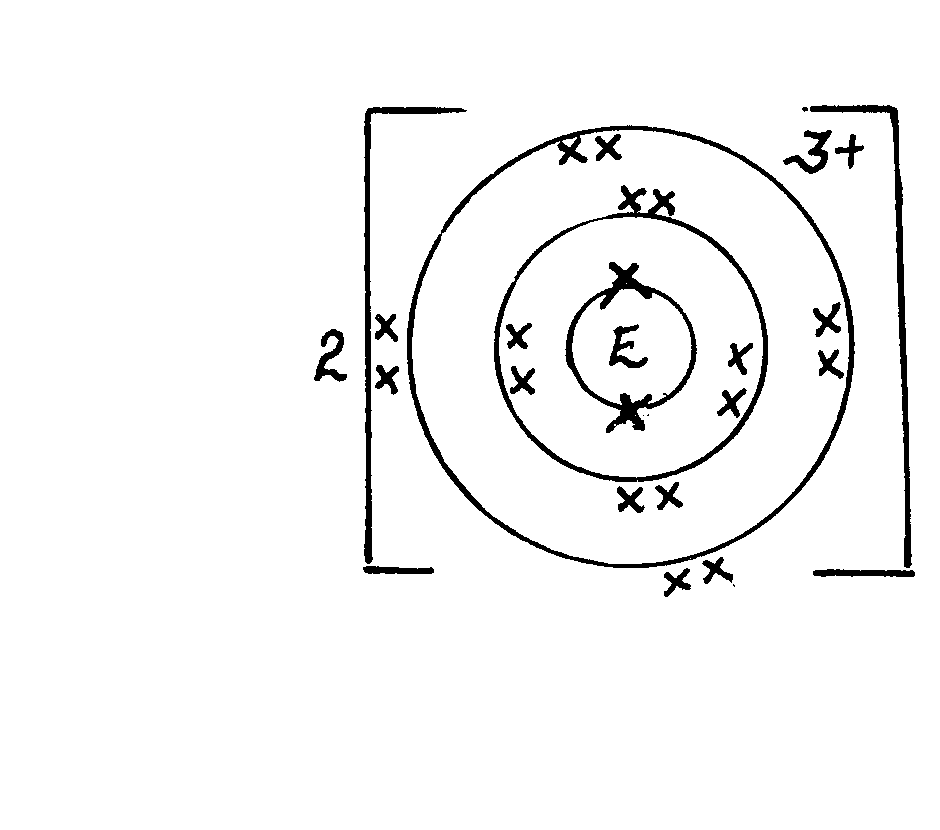
c) i) ENO3 or KNO3 1mk

ii) 4B(s) + 3O2(g) 2B2O(s) States ½ mk

Balanced ½ mk

d) Ionic

Transfer of electrons.

1. B has a stronger metallic  ½ bond than E and 3 valence  ½ electrons while E

has one valence electron. 1mk

1. 2A(s) + 2H2O(l)  2AOH(aq) + H2(g) 1mk 