

MARKING GUIDE:

TRINITY COLLEGE NABBINGO

S.4 CHEMISTRY

TOPICAL TEST

(ELECTROLYSIS B)

DURATION: 1 HOUR

X/34

1. (a) Dilute copper (ii) chloride solution was electrolyzed between graphite electrodes. (01mark)
State what was observed at the

(i) Cathode

A brown solid ✓

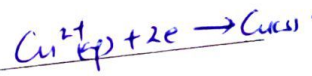
(ii) Anode

Effervescence of a colourless gas ✓
-rej test of the gas; -rej it bubbles or effervescence missing

(iii) Write the equation for the reaction at the

Anode $4OH^- \rightarrow 2H_2O + O_2$ ✓
-rej unbalanced equation

Cathode



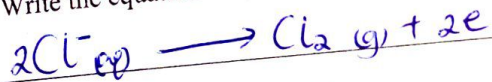
- (b) The electrolysis in (a) above was repeated using concentrated copper(ii) chloride (01mark)

(i) State what was observed at the Anode.

A greenish yellow gas ✓

Acc. green-yellow gas
rej green yellow gas (1mark)

(ii) Write the equation for the reaction at the anode



rej Cl, Cl, etc Cl etc.

(02marks)

(iii) Explain your answer in b(i) above.

Cl^- ions are more concentrated than OH^- ✓

and hence will be discharged in preference to OH^- ✓

- (c) The electrolysis in (a) was repeated using copper electrodes.

(i) State what was observed at the

Anode Decreases in size. ✓

(01mark)

Cathode

Increases in size; ✓ A brown solid. ✓ (01 mark)

(ii) Write equation for reaction at the

Anode $\text{Cu(s)} \rightarrow \text{Cu}^{2+}_{(\text{aq})} + 2\text{e}^-$ ✓ rej Cu ✓ (2 marks)

Cathode $\text{Cu}^{2+}_{(\text{aq})} + 2\text{e}^- \rightarrow \text{Cu(s)}$ ✓ rej Cu ✓

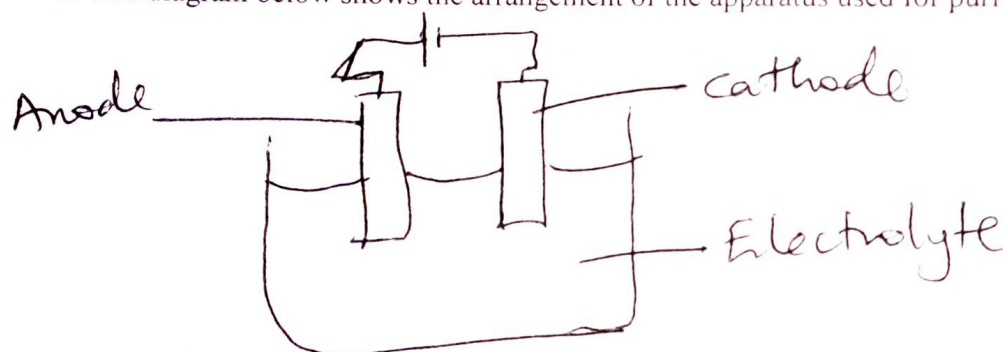
(d) State the factors affecting the discharge of ions at the electrodes that are demonstrated in the following parts of the question (3 marks)

(a) Position of ions in ECS ✓

(b) Concentration of ions ✓

(c) Nature of electrodes ✓

2. The diagram below shows the arrangement of the apparatus used for purification of copper.



(a) Name the substance used as (3 marks)

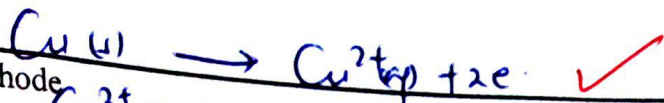
(i) Anode Impure copper ✓

(ii) Cathode Pure copper ✓

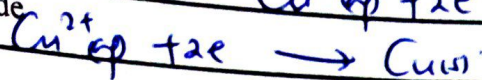
(iii) Electrolyte Copper(II) sulphate solution ✓

(b) Write the equation at the (2 marks)

(i) Anode



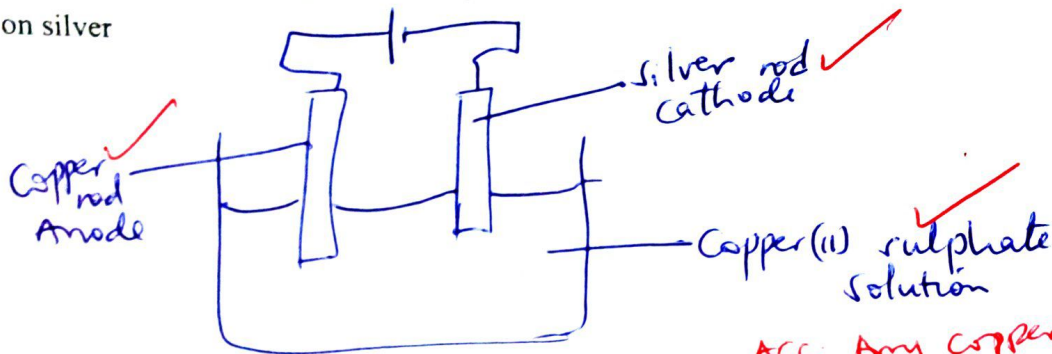
(ii) Cathode



3. (a) Define the term electroplating (1 mark)

Coating of a metal higher in E.C.S onto another metal using electrolysis

(b) In the space provided below, draw a set up of the experiment that can be used to electroplate copper on silver



(c) State any other 3 applications of electrolysis

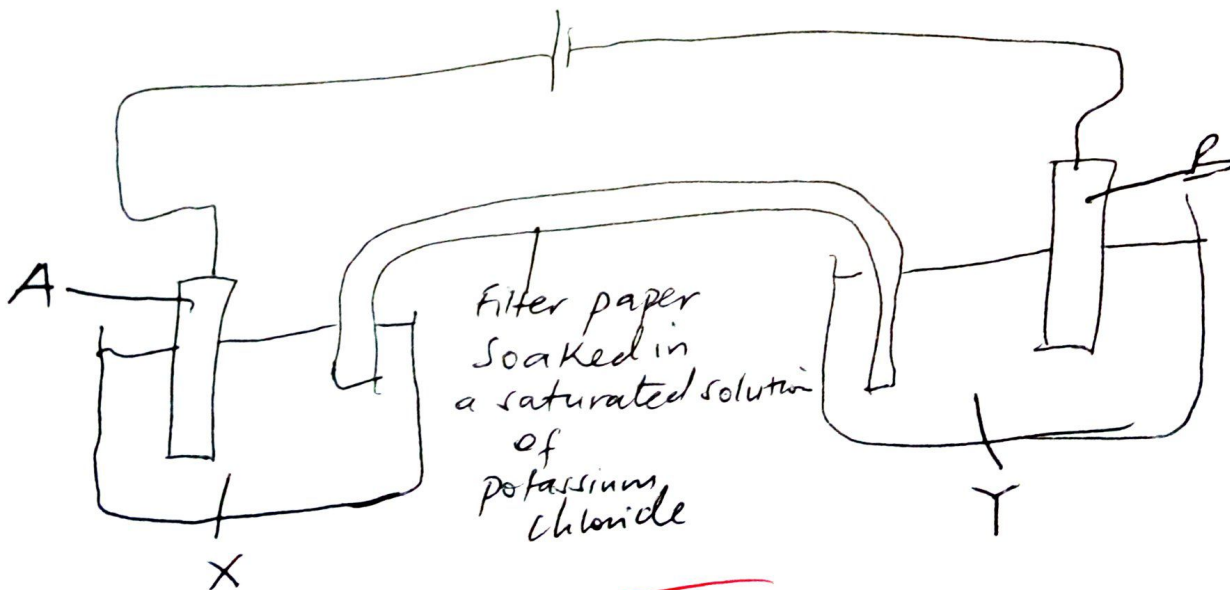
Extraction of metals

Anodisation

Manufacture of sodium hydroxide

ACC: Any other correct

4. Study the diagram below and answer the questions that follow



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(a) Name the metal strip

(i) A Zinc ✓ *rej Zn*

(ii) B Copper ✓ *rej Cu*

(b) Identify liquid

(i) X Zinc sulphate solution ✓

Acc. ZnSO₄

(ii) Z Copper(II) sulphate soln. ✓

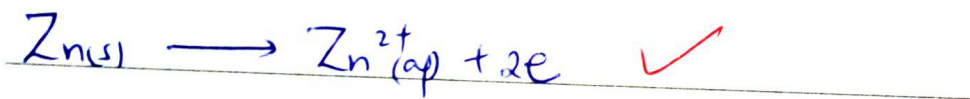
Acc. CuSO₄ rej CuSO₄

(b) State the purpose of the filter paper

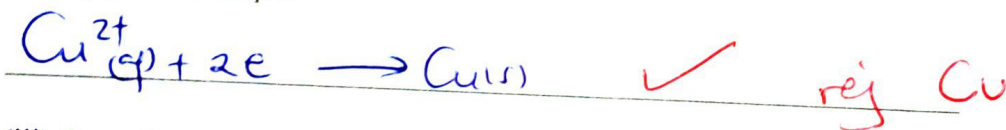
Acts as salt bridge ✓
Acc. separates the two solutions but completes the circuit

(c) Write the

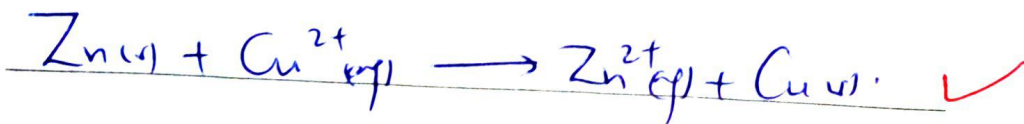
(i) Equation at strip A



(ii) Equation at strip B



(iii) Overall equation of the cell



END

- rej wrong symbols

SCIENCE IS A DOGMA

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