



Paper 1

- 1 Which of the following shows the energy conversion during electrolysis process?

Antara yang berikut, yang manakah menunjukkan perubahan tenaga yang berlaku semasa proses elektrolisis?

- A Chemical energy → Electrical energy
Tenaga kimia → Tenaga elektrik
B Electrical energy → Chemical energy
Tenaga elektrik → Tenaga kimia
C Potential energy → Electrical energy
Tenaga keupayaan → Tenaga elektrik
D Electrical energy → Sound energy
Tenaga elektrik → Tenaga bunyi

- 2 Diagram 1 shows a simple electrolytic cell.

Rajah 1 menunjukkan suatu sel elektrolitik yang ringkas.

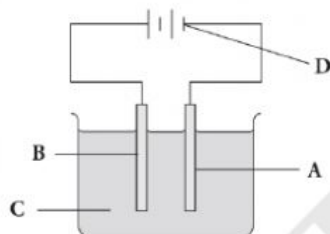


Diagram 1/ Rajah 1

Which of the following part is the anode?

Antara bahagian berikut, yang manakah anod?

- 3 Which of the following substance can be use as electrolyte in the electrolysis process?

Antara bahan berikut, yang manakah boleh digunakan sebagai elektrolit dalam proses elektrolisis?

- A Sugar solution
Larutan gula
B Lead(II) bromide powder
Serbuk plumbum(II) bromida
C Naphthalene
Nafialena
D Copper(II) sulphate solution
Larutan kuprum(II) sulfat

- 4 What are the cations present in the electrolysis of sodium sulphate solution?

Apakah kation yang hadir dalam suatu proses elektrolisis larutan natrium sulfat?

- A OH^- and NO_3^- / OH^- dan NO_3^-
B OH^- and SO_4^{2-} / OH^- dan SO_4^{2-}
C K^+ and H^+ / K^+ dan H^+
D Na^+ and H^+ / Na^+ dan H^+

- 5 Which of the following ion is the easiest to be discharge according to the electrochemical series?

Antara berikut, ion yang manakah paling senang untuk dinyahcaskan mengikut siri elektrokimia?

- A Potassium ion
Ion kalium
B Copper(II) ion
Ion kuprum(II)
C Hydrogen ion
Ion hidrogen
D Silver ion
Ion argentum

- 6 Diagram 2 shows an electrolysis process carried out using molten lead(II) bromide, PbBr_2 .

Rajah 2 menunjukkan suatu proses elektrolisis yang dijalankan dengan menggunakan leburan plumbum(II) bromida, PbBr_2 .

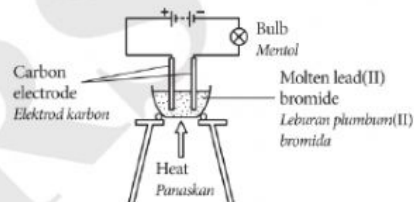


Diagram 2/ Rajah 2

What can be observed?

Apakah yang dapat diperhatikan?

- A The bulb lights up.
Mentol menyala.
B The bulb does not light up.
Mentol tidak menyala.
C Chlorine gas is produced
Gas klorin terhasil
D Zinc metal is produced at cathode.
Logam zink terhasil di katod.
- 7 Diagram 3 shows the electrolysis of molten lead(II) bromide.

Rajah 3 menunjukkan elektrolisis bagi leburan plumbum(II) bromida.

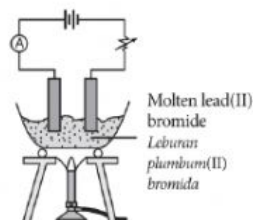


Diagram 3/ Rajah 3

What will happen at anode?

Apakah yang akan berlaku pada anod?

- A Producing of grey and shining lead metal.
Logam plumbum berwarna kelabu dan berkilat terhasil.
- B Releasing of bromine gas.
Pembebasan gas bromin.
- C Releasing of lead(II) ion, Pb^{2+} .
Pembebasan ion plumbum(II), Pb^{2+} .
- D No change.
Tiada perubahan.

Diagram 4 shows an electroplating of iron spoon with copper rod.

Rajah 4 menunjukkan penyaduran sudu besi dengan rod kuprum.

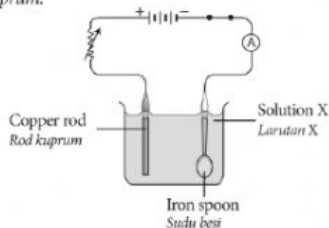


Diagram 4/ Rajah 4

What are the cathode and solution X?

Apakah katod dan larutan X?

	Cathode Katod	Solution X Larutan X
A	Copper rod Rod kuprum	Copper(II) sulphate Kuprum(II) sulfat
B	Copper rod Rod kuprum	Magnesium nitrate Magnesium nitrat
C	Iron spoon Sudu besi	Copper(II) sulphate Kuprum(II) sulfat
D	Iron spoon Sudu besi	Magnesium nitrate Magnesium nitrat

Diagram 5 shows a rusty nail.

Rajah 5 menunjukkan paku yang berkarat.



Diagram 5/ Rajah 5

Which of the following process can be used to avoid rusting?

Antara berikut, proses manakah yang dapat mengelakkan dari pengurangan?

- A Extraction
Pengekstrakan
- B Electroplating
Penyaduran
- C Purification
Penulenan
- D Drying
Pengeringan

10 Diagram 6 shows the apparatus set up used for purification of metal.

Rajah 6 menunjukkan susunan radas yang digunakan dalam penulenan logam.

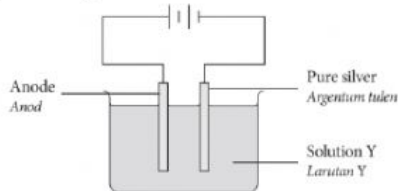


Diagram 6/ Rajah 6

Based on Diagram 6, what are the anode and solution Y?

Berdasarkan Rajah 6, apakah anod dan larutan Y?

	Anode Anod	Solution Y Larutan Y
A	Pure silver Argentum tulen	Silver nitrate Argentum nitrat
B	Pure silver Argentum tulen	Copper(II) sulphate Kuprum(II) sulfat
C	Impure silver Argentum tak tulen	Silver nitrate Argentum nitrat
D	Impure silver Argentum tak tulen	Copper(II) sulphate Kuprum(II) sulfat

11 A student carried out an electroplating process as in Diagram 7.

Seorang murid telah menjalankan proses penyaduran seperti dalam Rajah 7.

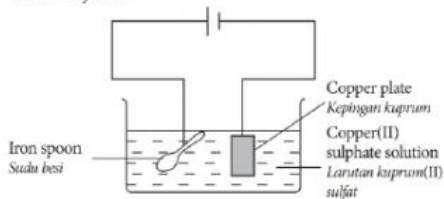


Diagram 7/ Rajah 7

The electroplating process carried out by the student was not successful. Why?

Proses penyaduran yang dijalankan oleh murid itu tidak berjaya. Mengapa?

- A Iron spoon is corroded in the copper(II) sulphate solution.
Sudu besi terkakis di dalam larutan kuprum(II) sulfat.
- B Electrolytes contain copper(II) ion, Cu^{2+} .
Elektrolit mengandungi ion kuprum(II), Cu^{2+} .
- C Copper cannot be used as electrode.
Kuprum tidak boleh digunakan sebagai elektrod.
- D The electrical source terminals were connected incorrectly.
Terminal sumber elektrik tidak disambungkan dengan betul.

- 12 Diagram 8 shows an electroplating process.
Rajah 8 menunjukkan proses penyaduran.

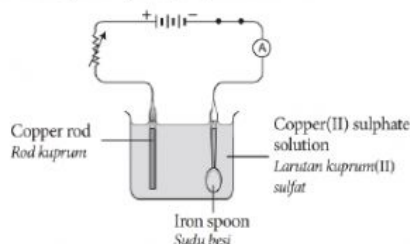


Diagram 8/ Rajah 8

What will happen at anode?

Apakah yang akan berlaku pada anod?

- A No change in mass.
Tiada perubahan pada jisim.
- B Decrease in mass.
Pengurangan jisim.
- C Deposition of copper.
Pengenapan kuprum.
- D Release of gas.
Pembebasan gas.
- 13 Which of the following metal will most likely become negative terminal in the chemical cell?
Antara logam berikut, yang manakah paling mungkin menjadi terminal negatif dalam sel kimia?
- | | |
|--------------------------|--------------------|
| A Magnesium
Magnesium | C Iron
Ferum |
| B Zinc
Zink | D Copper
Kuprum |
- 14 Which of the following is the application of chemical cell?
Antara yang berikut, yang manakah merupakan aplikasi sel kimia?
- A Generating electrical energy from seawater.
Menghasilkan tenaga elektrik daripada air laut.
- B Electroplating of metal.
Penyaduran logam.
- C Wastewater treatment using electrocoagulation.
Merawat air sisa menggunakan elektro-penggumpalan.
- D Penulenan logam.
Purification of metal.
- 15 Diagram 9 shows a simple chemical cell.
Rajah 9 menunjukkan sel kimia ringkas.

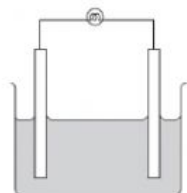


Diagram 9/ Rajah 9

Which pair of electrodes will produce the brightest light bulb?

Pasangan elektrod manakah akan menghasilkan nyalaan mentol paling terang?

- A Both electrodes are magnesium.
Kedua-dua elektrod ialah magnesium.
- B Magnesium and copper.
Magnesium dan kuprum.
- C Zinc and copper.
Zink dan kuprum.
- D Both electrodes are copper.
Kedua-dua elektrod ialah kuprum.

- 16 Diagram 10 shows a chemical cell.
Rajah 10 menunjukkan sel kimia.

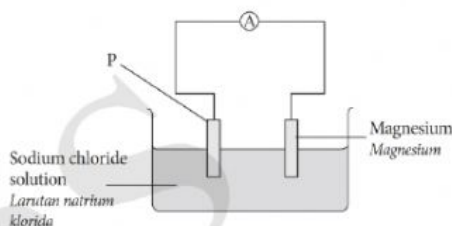


Diagram 10/ Rajah 10

Which of the following is electrode P if the needle of the ammeter is not deflected?

Manakah antara berikut merupakan elektrod P sekiranya jarum ammeter tidak terpesong?

- A Copper
Kuprum
- B Iron
Ferum
- C Magnesium
Magnesium
- D Silver
Argentum
- 17 Which of the following pairs of electrodes produces electricity in a chemical cell?
Antara pasangan elektrod berikut, yang manakah menghasilkan elektrik dalam sel kimia?
- A Zinc and copper
Zink dan kuprum
- B Phosphorus dan lead
Fosforus dan plumbum
- C Tin dan sulphur
Stanum dan sulfur
- D Both electrodes are zinc
Kedua-dua elektrod ialah zink