4541/3
Kimia
Kertas 3
1 ½ jam

Nama : ……

Tingkatan : ……

KEMENTERIAN PENDIDIKAN MALAYSIA

Jabatan Pendidikan Negeri Pulau Pinang

MODUL LATIHAN BERFOKUS SPM 2020

KIMIA
KERTAS 3
CEMERLANG (SET 2)
1 JAM 30 MINIT

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Kertas soalan ini adalah dalam dwibahasa.
2.
3. Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.
4. Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Melayu.

Untuk kegunaan pemeriksa sahaja		
Soalan	Markah Penuh	Markah diperolehi
1	33	
2	17	
Jumlah	**50**	

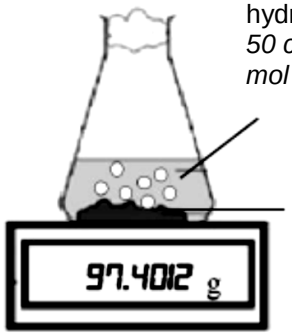
Modul ini mengandungi 8 halaman bercetak

Answer **all** questions. / *Jawab **semua** soalan*

1. A student carried out an experiment to study the effect of catalyst on the rate of reaction between magnesium and dilute hydrochloric acid.
Seorang murid telah menjalankan satu eksperimen untuk mengkaji kesan mangkin ke atas kadar tindak balas antara magnesium dengan asid hidroklorik cair.

Diagram 1 shows the reading of the electronic balance for the mass of the reaction mixture at 0 s, 60 s, 120 s and 180 s in Set I.
Rajah 1 *menunjukkan bacaan penimbang elektronik bagi jisim campuran tindak balas pada masa* 0 s, 60 s, 120 s *dan* 180 s *dalam Set* I.

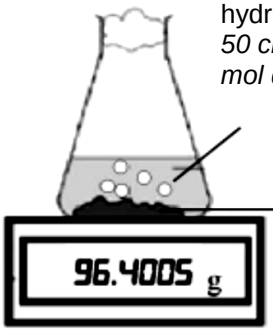
Set I
Set I



50 cm^3 of 0.1 mol dm^{-3} of hydrochloric acid
50 cm^3 asid hidroklorik 0.1 mol dm^{-3}

Magnesium
Magnesium

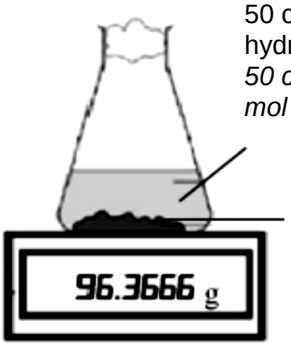
Time : 0 s
Masa : 0 s



50 cm^3 of 0.1 mol dm^{-3} of hydrochloric acid
50 cm^3 asid hidroklorik 0.1 mol dm^{-3}

Magnesium
Magnesium

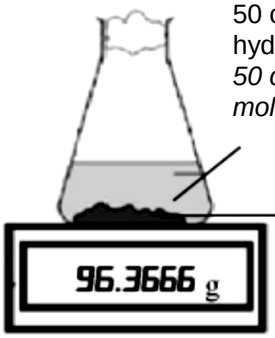
Time : 60 s
Masa : 60 s



50 cm^3 of 0.1 mol dm^{-3} of hydrochloric acid
50 cm^3 asid hidroklorik 0.1 mol dm^{-3}

Magnesium
Magnesium

Time : 120 s
Masa : 120 s



50 cm^3 of 0.1 mol dm^{-3} of hydrochloric acid
50 cm^3 asid hidroklorik 0.1 mol dm^{-3}

Magnesium
Magnesium

Time : 180 s
Masa : 180 s

Diagram 1 / *Rajah 1*

(a) Based on Diagram 1, complete Table 1 by recording the masses of reaction mixture, correct to two decimal places.

Berdasarkan Rajah 1*, lengkapkan Jadual* 1 *dengan merekodkan jisim campuran tindak balas betul kepada dua tempat perpuluhan.*

Time (s) *Masa (s)*	0	*60*	120	180
Mass of reaction mixture/g *Jisim campuran tindak balas (g)*				

Table 1 / *Jadual 1*

[3 marks/ 3 *markah*]

(b) The experiment is repeated by adding copper(II) sulphate solution into the mixture of magnesium and hydrochloric acid in Set II.

Eksperimen diulangi dengan menambahkan larutan kuprum(II) *sulfat ke dalam campuran magnesium dan asid hidroklorik bagi Set* II*.*

For this experiment, state:

Bagi eksperimen ini, nyatakan:

(i) manipulated variable.

pemboleh ubah dimanipulasikan.

……

(ii) responding variable.

pemboleh ubah bergerak balas.

……

(iii) fixed variable.

pemboleh ubah dimalarkan.

……

[3 marks/ 3 *markah*]

(c) State **one** hypothesis for this experiment.

*Nyatakan **satu** hipotesis bagi eksperimen ini.*

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[3 marks/ 3 *markah*]

(d) (i) Based on Diagram 1, state **one** observation for this experiment.

Berdasarkan Rajah 1*, nyatakan **satu** pemerhatian bagi eksperimen ini.*

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[3 marks/ 3 *markah*]

(ii) Give the corresponding inference based on your answer in 1(*d*)(i).

Berikan inferens yang sepadan berdasarkan jawapan di 1(*d*)(i).

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[3 marks/ 3 *markah*]

(e) (i) Based on Table 1, plot a graph of mass of reaction mixture against time on the graph paper given.
Berdasarkan Jadual 1*, lukis graf jisim campuran tindak balas melawan masa di atas kertas graf yang diberi.*

[3 marks/ 3 *markah*]

(ii) Sketch the curve obtained for Set II on the same axis in (*e*)(i).

Lakarkan lengkung yang diperoleh bagi set II *pada paksi yang sama di* (*e*)(i).

[3 marks/ 3 *markah*]

(f) Based on experiment Set I, state how the mass of reaction mixture changes with time.
Berdasarkan eksperimen Set I*, nyatakan bagaimana jisim campuran tindak balas berubah dengan masa.*

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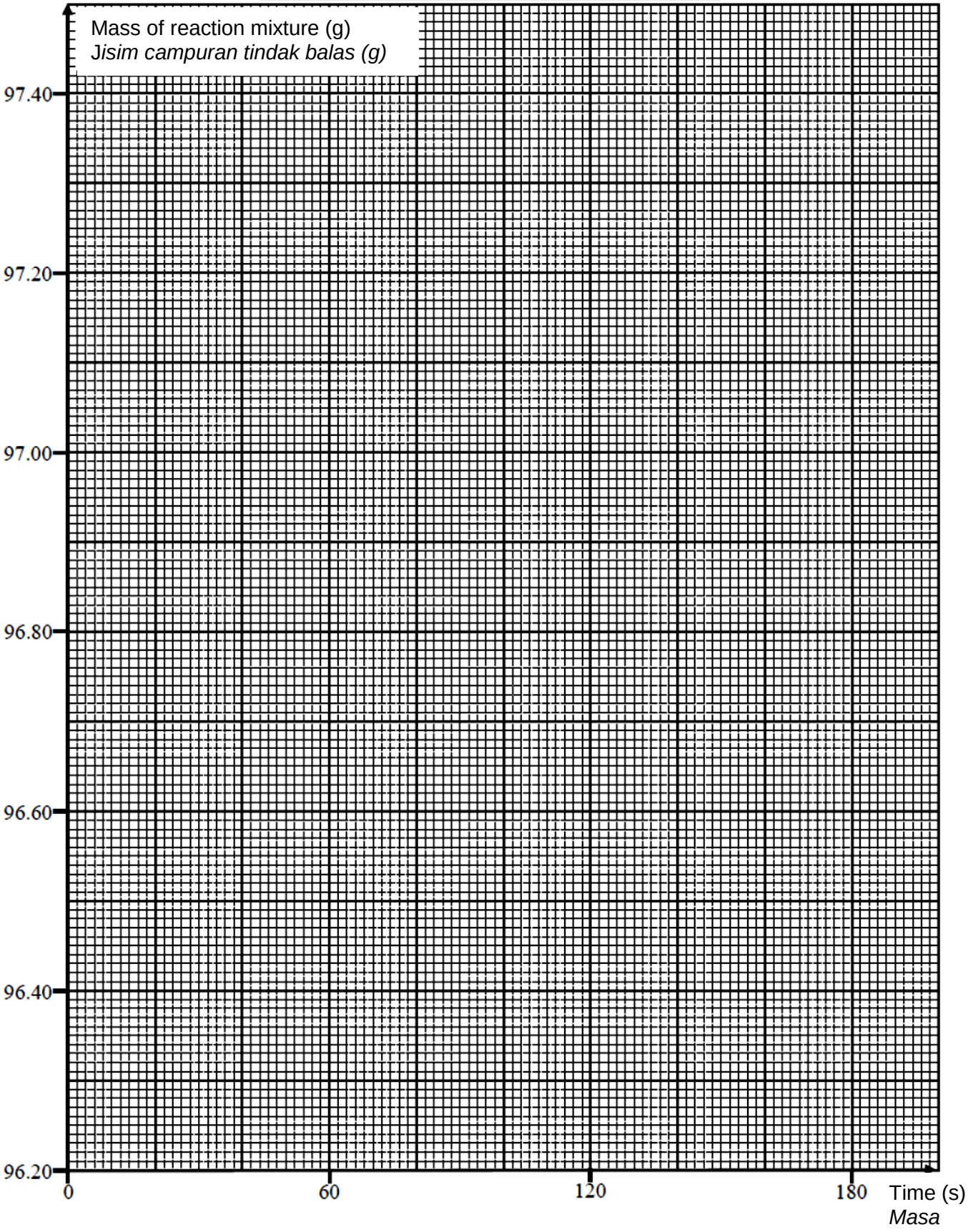
[3 marks/ 3 *markah*]

Graph of mass of reaction mixture against time
Graf jisim campuran tindak balas melawan masa



(g) State the operational definition for the rate of reaction in this experiment.

Nyatakan definisi secara operasi bagi kadar tindak balas dalam eksperimen ini.

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……

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[3 marks/ 3 *markah*]

(h) Referring to your graph, how do the rate of reaction in Set I and Set II differ? Give your reason.
Merujuk pada graf anda, bagaimanakah kadar tindak balas dalam Set I *dan Set* II *berbeza? Berikan alasan anda.*

……

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[3 marks/ 3 *markah*]

(i) The chemical equation for the reaction in Set I and Set II can be written as follows:
Persamaan kimia bagi tindak balas Set I *dan Set* II *boleh ditulis seperti berikut:*

$$Mg + 2HCl \longrightarrow MgCl_2 + H_2$$

Classify the substances into elements and compounds.
Kelaskan bahan-bahan ini kepada unsur dan sebatian.

[3 marks/ 3 *markah*]

2. Diagram 2 shows a conversation between two students about the results of two different experiments.

Rajah 2 menunjukkan perbualan antara dua orang pelajar mengenai keputusan dua eksperimen yang berbeza.

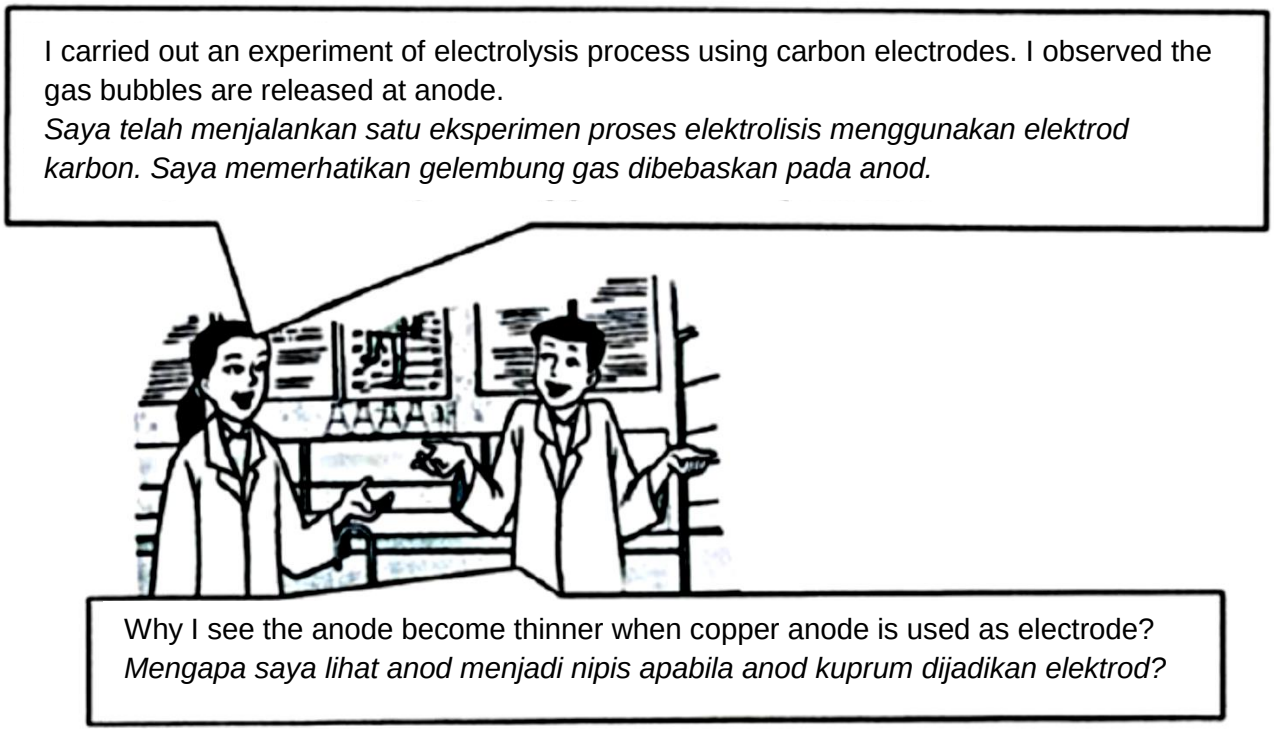

Diagram 2 / *Rajah* 2

Based on the situation, plan a laboratory experiment to study the effect of the type of electrode to the product at anode. Your planning should include the following aspects:

Berdasarkan situasi tersebut, rancangkan satu eksperimen makmal untuk mengkaji kesan jenis elektrod kepada hasil tindak balas di anod. Perancangan anda hendaklah mengandungi aspek-aspek berikut:

(*a*) Problem statement
Penyataan masalah

(*b*) All the variables
Semua pembolehubah

(*c*) Statement of the hypothesis
Penyataan hipotesis

(*d*) List of materials and apparatus
Senarai bahan dan radas

(*e*) Procedure for the experiment
Prosedur eksperimen

(*f*) Tabulation of data
Penjadualan data

[17 marks / 17 *markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT