

SENARAI SEMAK CALON/ CANDIDATE CHECKLIST

ARAHAN: Anda dikehendaki menyemak radas dan bahan, membaca soalan dan merancang eksperimen dalam tempoh lima minit yang pertama. Tandakan (✓) pada ruangan yang disediakan sekiranya radas dan bahan yang disenaraikan dalam jadual dibekalkan.

INSTRUCTION: You are required to check the list of apparatus and materials, read the question and plan the experiment in the first five minutes. Tick (✓) in the space provided if the apparatus and materials listed in the table are supplied.

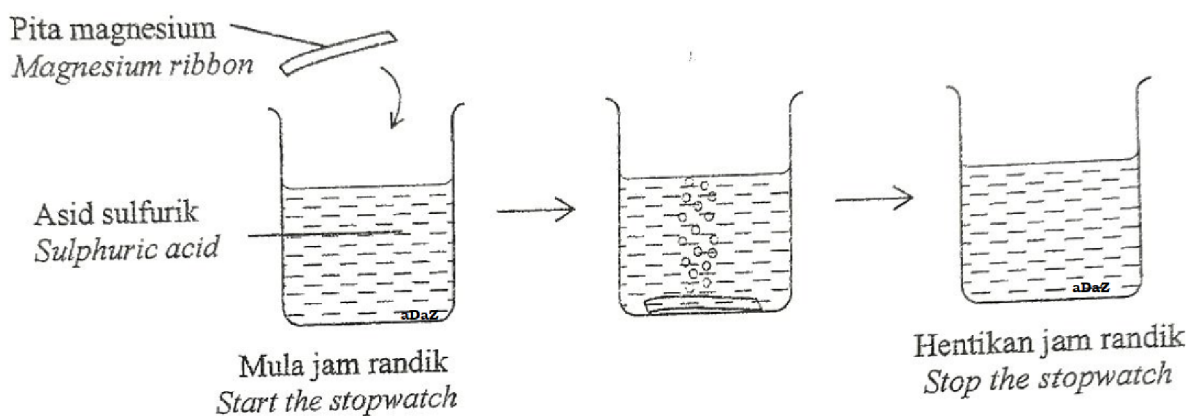
No	Radas dan bahan <i>Apparatus and material</i>	Kuantiti Quantity	Ya (✓) / Tidak (x) Yes (✓) / No (x)
1	Silinder penyukat 10 ml <i>10 ml Measuring cylinder</i>	1	
2	Silinder penyukat 50 ml <i>50 ml Measuring cylinder</i>	1	
3	Bikar 100 ml <i>100 ml beaker</i>	1	
4	Bikar 50 ml <i>50 ml beaker</i>	5	
5	Jam randik <i>Stopwatch</i>	1	
6	Pita magnesium (2 cm) <i>Magnesium ribbon (2 cm)</i>	5	
7	Asid sulfurik, H ₂ SO ₄ 2.0 mol dm ⁻³ 2.0 mol dm ⁻³ sulphuric acid, H ₂ SO ₄	100 cm ³	
8	Botol berisi air suling <i>Wash bottle filled with distilled water</i>	1	
9	Rod kaca <i>Glass rod</i>	1	

1. Anda dikehendaki menjalankan satu eksperimen untuk mengkaji kesan kepekatan terhadap kadar tindak balas.

You are required to carry out an experiment to investigate the effect of concentration on the rate of reaction.

Rajah 1 menunjukkan susunan radas bagi menentukan kadar tindak balas antara magnesium, Mg dengan asid sulfurik, H₂SO₄.

Diagram 1 shows the set-up apparatus to determine the rate of reaction between magnesium, Mg and sulphuric acid, H₂SO₄.



1. Isikan bikar dengan 20.0 cm^3 asid sulfurik, H_2SO_4 2.0 mol dm^{-3} .
Fill a beaker with 20.0 cm^3 of 2.0 mol dm^{-3} sulphuric acid, H_2SO_4 .
2. Tambah pita magnesium ke dalam asid sulfurik.
Put the magnesium ribbon into the sulphuric acid.
3. Dengan serta-merta, mulakan jam randik.
Start the stopwatch immediately.
4. Hentikan jam randik sebaik sahaja pita magnesium melarut dengan sepenuhnya.
Stop the stopwatch when the magnesium ribbon dissolves completely.
5. Rekod dan catat masa yang diambil dalam Jadual 1.
Record the time taken in the Table 1.
6. Ulangi eksperimen sebanyak 4 kali dengan menggunakan asid sulfurik, H_2SO_4 , 2.0 mol dm^{-3} yang telah dicairkan dengan air suling seperti dalam Jadual 1.
Repeat the experiment for 4 times by using the diluted sulphuric acid, H_2SO_4 as shown in Table 1.

(a) masa untuk magnesium larut dalam Jadual 1.
Record the time taken for magnesium ribbon to dissolve in Table 1.

Eksperimen <i>Experiment</i>	I	II	III	IV	V
Isipadu asid sulfurik, H_2SO_4 2.0 mol dm^{-3} (cm^3) <i>Volume of 2 mol dm^{-3} sulphuric acid, H_2SO_4 (cm^3)</i>	20.0	16.0	12.0	8.0	4.0
Isipadu air suling (cm^3) <i>Volume of distilled water (cm^3)</i>	0.0	4.0	8.0	12.0	16.0
Kepekatan asid sulfurik, H_2SO_4 (mol dm^{-3}) <i>Concentration of sulphuric acid, H_2SO_4 (mol dm^{-3})</i>	2.0	1.6	1.2	0.8	0.4
Masa untuk pita magnesium larut (s) <i>Time taken for magnesium ribbon to dissolve (s)</i>					

[2 markah] [2 marks]

(b) Nyatakan satu pemerhatian dalam Set I.

State one observation in Set I.

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[1 markah] [1 mark]

(c) Nyatakan satu hipotesis untuk eksperimen ini.

State one hypothesis for this experiment.

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[2 markah] [2 marks]

(d) (i) Berdasarkan Jadual 1, plot graf kepekatan asid sulfurik melawan masa pada kertas graf.

based on Table 1, plot a graph of concentration of sulphuric acid against time on the graph paper.

[3 markah] [3 marks]

(ii) Berdasarkan graf yang telah diplot, tentukan masa untuk magnesium larut jika kepekatan asid sulfurik yang digunakan ialah 1.0 mol dm^{-3} .

Based on the plotted graph, determine the time taken for magnesium to dissolve if the concentration of sulphuric acid used is 1.0 mol dm^{-3} .

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[2 markah] [2 marks]

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

State the operational definition of the rate of reaction in this experiment.

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[2 markah] [2 marks]

(f) Berdasarkan eksperimen, nyatakan hubungan antara saiz magnesium dengan masa.

Based on the experiment, state the relationship between the size of magnesium and time.

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[1 markah] [1 mark]