

**SENARAI SEMAK CALON
CANDIDATES CHECK LIST**

ARAHAN

Anda dikehendaki menyemak senarai radas, membaca soalan dan merancang eksperimen dalam tempoh lima minit 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 questions 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.

Bil. No.	Radas / Bahan <i>Apparatus / Materials</i>	Kuantiti <i>Quantity</i>	Ya (✓) / Tidak (X) <i>Yes (✓) / No (X)</i>
1	Bikar berisi 50 cm ³ larutan kuprum(II) sulfat, CuSO ₄ , 2.0 mol dm ⁻³ <i>Beaker containing 50 cm³ of 2.0 mol dm⁻³ of copper(II) sulphate solution, CuSO₄</i>	1	
2	3 cm pita magnesium <i>3 cm magnesium ribbon</i>	1	
3	3 cm jalur zink <i>3 cm zinc strip</i>	1	
4	Cawan plastik <i>Plastic cup</i>	2	
5	Kertas turas <i>Filter paper</i>	2	
6	Silinder penyukat 50 cm ³ <i>50 cm³ measuring cylinder</i>	1	
7	Termometer <i>Thermometer</i>	1	

Jadual 1
Table 1



- 1 Tindak balas penyesaran berlaku apabila suatu logam disesarkan daripada larutan garamnya oleh logam yang lebih elektropositif.

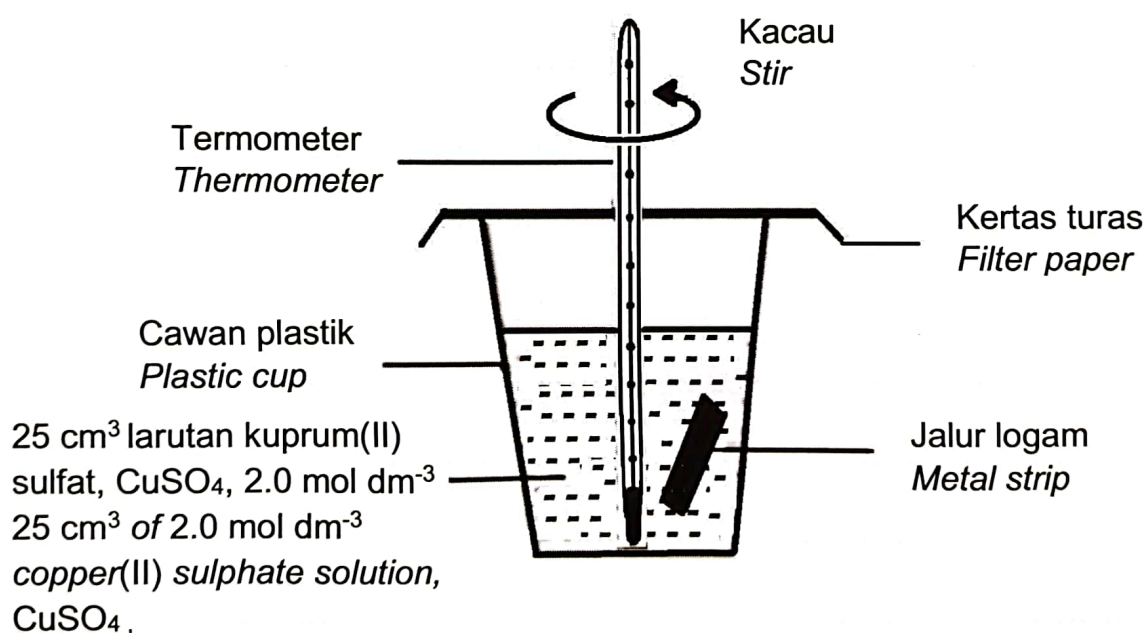
Anda dikehendaki menjalankan satu eksperimen untuk menentukan haba penyesaran kuprum daripada larutan kuprum(II) sulfat, CuSO_4 , 2.0 mol dm^{-3} oleh logam magnesium dan logam zink.

A displacement reaction occurs when a metal is displaced from its salt solution by a more electropositive metal.

You are required to carry out an experiment to determine the heat of displacement of copper from copper(II) sulphate, CuSO_4 , 2.0 mol dm^{-3} solution with magnesium metal and zinc metal.

Rajah 1 menunjukkan susunan radas eksperimen yang akan dijalankan.

Diagram 1 shows the apparatus set-up of the experiment that will be conducted.



Rajah 1
Diagram 1

- (c) Lengkapkan Jadual 2 untuk merekodkan keputusan bagi eksperimen ini.
Complete Table 2 to record the results of the experiment.

Logam Metal	Suhu awal larutan kuprum(II) sulfat ($^{\circ}\text{C}$) <i>Initial temperature of copper(II) sulphate solution ($^{\circ}\text{C}$)</i>	Suhu tertinggi campuran ($^{\circ}\text{C}$) <i>Highest temperature of the mixture ($^{\circ}\text{C}$)</i>	Perubahan suhu ($^{\circ}\text{C}$) <i>Change in temperature ($^{\circ}\text{C}$)</i>
Magnesium			
Zink			

Jadual 2

Table 2

[3 markah]

[3 marks]

- (d) Berdasarkan keputusan dalam Jadual 2, hitung haba penyesaran bagi tindak balas antara larutan kuprum(II) sulfat dengan magnesium.

Based on the results in Table 2, calculate the heat of displacement for the reaction between copper(II) sulphate solution and magnesium.

[Muatan haba tentu air = $4.2 \text{ J g}^{-1} \text{ }^{\circ}\text{C}^{-1}$, ketumpatan air = 1.0 g cm^{-3}]

[Specific heat capacity of water = $4.2 \text{ J g}^{-1} \text{ }^{\circ}\text{C}^{-1}$, density of water = 1.0 g cm^{-3}]

Bilangan mol larutan, n <i>Number of moles of solution, n</i>	$= \frac{MV}{1000}$
--	---------------------

Perubahan haba, Q <i>Heat change, Q</i>	$= mc\theta$
--	--------------

Haba tindak balas, ΔH <i>Heat of reaction, ΔH</i>	$= \frac{Q}{n}$
---	-----------------

[3 markah]

[3 marks]

- (e) Lukiskan gambar rajah aras tenaga bagi tindak balas di antara larutan kuprum(II) sulfat dengan magnesium.
Draw an energy level diagram for the reaction between copper(II) sulphate solution and magnesium.

Tenaga
Energy



[2 markah]
[2 marks]

- (f) Ramalkan suhu tertinggi campuran sekiranya larutan kuprum(II) sulfat digantikan dengan larutan kuprum(II) nitrat dan ditindak balaskan dengan logam zink.
Predict the highest temperature of the mixture if the copper(II) sulphate solution is replaced with copper(II) nitrate solution and is reacted with zinc metal.

.....
[1 markah]
[1 mark]

- (g) Kelaskan bahan-bahan tindak balas yang digunakan dalam eksperimen ini kepada agen penurunan dan agen pengoksidaan.
Classify the reactants used in this experiment into reducing agent and oxidizing agent.

[2 markah]
[2 marks]

– KERTAS SOALAN TAMAT –
– END OF QUESTION PAPER –