

JAWAPAN KERTAS 3

SET 1

Soalan Question	Jawapan Answers	Markah Marks																
2.	Boleh merekodkan bacaan suhu dengan betul yang mengandungi maklumat berikut: <i>Able to record the temperature readings correctly which include the following information:</i> 1. Bacaan termometer – 1 titik perpuluhan <i>Thermometer reading – 1 decimal place</i> 2. Bacaan suhu awal yang betul [28.0 – 30.0] <i>Correct initial temperature [28.0 - 30.0]</i> 3. Semua bacaan adalah betul. <i>All readings are correct.</i> 4. Bacaan termometer menunjukkan suhu meningkat dan menurun. <i>Thermometer readings show increase and decrease of temperature.</i> <table><tr><th>Jumlah isi padu asid sulfurik <i>Total volume of sulphuric acid</i></th><th>Suhu (°C) <i>Temperature (°C)</i></th></tr><tr><td>0.0</td><td>28.0</td></tr><tr><td>5.0</td><td>33.0</td></tr><tr><td>10.0</td><td>36.0</td></tr><tr><td>15.0</td><td>38.0</td></tr><tr><td>20.0</td><td>37.0</td></tr><tr><td>25.0</td><td>35.0</td></tr><tr><td>30.0</td><td>34.0</td></tr></table> [± 0.5 °C]	Jumlah isi padu asid sulfurik <i>Total volume of sulphuric acid</i>	Suhu (°C) <i>Temperature (°C)</i>	0.0	28.0	5.0	33.0	10.0	36.0	15.0	38.0	20.0	37.0	25.0	35.0	30.0	34.0	3
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(a)	Boleh menyatakan pemerhatian dengan betul. <i>Able to state the observation correctly.</i> (i) Bacaan thermometer meningkat. <i>Thermometer reading increases.</i>	1																
	Boleh menyatakan inferens berdasarkan pemerhatian dengan betul. <i>Able to state the inference based on the observation correctly.</i> (ii) Haba dibebaskan ke persekitaran. // Tindak balas eksotermik. <i>Heat is released to the surroundings. // Exothermic reaction.</i>	1																
(b)	Boleh menyatakan semua tiga pemboleh ubah dengan betul. <i>Able to state all the three variables correctly.</i> <table><tr><td>(i)</td><td>Pemboleh ubah dimanipulasikan: <i>Manipulated variable:</i></td><td>Jumlah isi padu asid sulfurik <i>Total volume of sulphuric acid</i></td></tr><tr><td>(ii)</td><td>Pemboleh ubah bergerak balas: <i>Responding variable:</i></td><td>Bacaan termometer // Suhu <i>Thermometer reading // Temperature</i></td></tr><tr><td>(iii)</td><td>Pemboleh ubah dimalarkan: <i>Fixed variable:</i></td><td>Asid sulfurik // Kepekatan asid sulfurik // Jenis asid / alkali <i>Sulphuric acid // Concentration of sulphuric acid // Type of acid / alkali</i></td></tr></table>	(i)	Pemboleh ubah dimanipulasikan: <i>Manipulated variable:</i>	Jumlah isi padu asid sulfurik <i>Total volume of sulphuric acid</i>	(ii)	Pemboleh ubah bergerak balas: <i>Responding variable:</i>	Bacaan termometer // Suhu <i>Thermometer reading // Temperature</i>	(iii)	Pemboleh ubah dimalarkan: <i>Fixed variable:</i>	Asid sulfurik // Kepekatan asid sulfurik // Jenis asid / alkali <i>Sulphuric acid // Concentration of sulphuric acid // Type of acid / alkali</i>	3							
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	(c) Boleh menyatakan hubungan yang betul antara pemboleh ubah dimanipulasikan dengan pemboleh ubah bergerak balas dengan berarah. <i>Able to state the relationship correctly between the manipulated variable and the responding variable with direction.</i> • Apabila jumlah isi padu asid sulfurik bertambah, <i>As the total volume of sulphuric acid increases,</i> • Suhu meningkat sehingga mencapai suhu maksimum / paling tinggi dan kemudian menurun. <i>The temperature increases until it reaches the maximum temperature / highest temperature and then decreases.</i>	2
	(d) Boleh menentukan kepekatan larutan natrium hidroksida dengan betul. <i>Able to determine the molarity of sodium hydroxide solution correctly.</i> Jawapan memenuhi syarat yang berikut: <i>The answer fulfills the following terms:</i> 1. Bilangan mol asid sulfurik. <i>Number of moles of sulphuric acid.</i> 2. Nisbah mol asid sulfurik kepada natrium hidroksida. <i>Mole ratio of sulphuric acid to sodium hydroxide solution.</i> 3. Jawapan dengan unit yang betul. <i>Answer with correct unit.</i> $n, \text{H}_2\text{SO}_4 = \frac{1.0 \times 15}{1000}$ $= 0.015 \text{ mol}$ $1 \text{ mol H}_2\text{SO}_4 : 2 \text{ mol NaOH}$ $0.015 \text{ mol H}_2\text{SO}_4 : 0.030 \text{ mol NaOH}$ $M = \frac{0.03 \times 1000}{30}$ $= 1.0 \text{ mol dm}^{-3}$ [0.97 – 1.03 mol dm⁻³]	3
	(e) Boleh menyatakan definisi secara operasi bagi takat akhir dengan betul. <i>Able to give the operational definition for end point accurately.</i> • Suhu maksimum / tertinggi tercapai, <i>The maximum temperature is achieved,</i> • Apabila asid sulfurik / asid ditambahkan / dicampurkan ke dalam larutan natrium hidroksida / alkali. <i>When sulphuric acid / acid is added into / mixed with sodium hydroxide solution / alkali.</i>	2



SET 2

Soalan Question	Jawapan Answers	Markah Marks																																				
(a)	<table><tr><td>Eksperimen <i>Experiment</i></td><td>I</td><td>II</td><td>III</td><td>IV</td><td>V</td></tr><tr><td>Isi padu larutan natrium tiosulfat, Na₂S₂O₃ (cm³) <i>Volume of sodium thiosulphate solution, Na₂S₂O₃ (cm3)</i></td><td>45</td><td>40</td><td>30</td><td>20</td><td>10</td></tr><tr><td>Isi padu air suling (cm³) <i>Volume of distilled water (cm3)</i></td><td>0</td><td>5</td><td>15</td><td>25</td><td>35</td></tr><tr><td>Isi padu asid sulfurik (cm³) <i>Volume of sulphuric acid, H₂SO₄ (cm3)</i></td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td></tr><tr><td>Jumlah isi padu campuran (cm³) <i>Total volume of mixture (cm³)</i></td><td>50</td><td>50</td><td>50</td><td>50</td><td>50</td></tr><tr><td>Masa diambil bagi tanda 'X' tidak kelihatan (s) <i>Time taken for the 'X' mark to disappear from view (s)</i></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Eksperimen <i>Experiment</i>	I	II	III	IV	V	Isi padu larutan natrium tiosulfat, Na₂S₂O₃ (cm³) <i>Volume of sodium thiosulphate solution, Na₂S₂O₃ (cm3)</i>	45	40	30	20	10	Isi padu air suling (cm³) <i>Volume of distilled water (cm3)</i>	0	5	15	25	35	Isi padu asid sulfurik (cm³) <i>Volume of sulphuric acid, H₂SO₄ (cm3)</i>	5	5	5	5	5	Jumlah isi padu campuran (cm³) <i>Total volume of mixture (cm³)</i>	50	50	50	50	50	Masa diambil bagi tanda 'X' tidak kelihatan (s) <i>Time taken for the 'X' mark to disappear from view (s)</i>						1
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(c)	Graf / Graph P1 Kedua-dua paksi dilabel dengan unit. <i>Both axes are labelled with units.</i> – Paksi-y: Kepekatan larutan natrium tiosulfat (mol dm⁻³) <i>y-axis: Concentration of sodium thiosulphate solution (mol dm⁻³)</i> – Paksi-x: $\frac{1}{\text{masa}}$ (s⁻¹) / <i>y-axis: $\frac{1}{\text{time}}$ (s⁻¹)</i> P2 Skala seragam / <i>Uniform scale</i> P3 Semua titik diplot dengan betul (melalui sekurang-kurangnya tiga titik). <i>All points are plotted correctly (pass through at least three points).</i> Saiz graf mesti melebihi 30% daripada kertas graf. <i>The size of the graph must be more than 30% of the graph paper.</i> Kepekatan larutan natrium tiosulfat, Na₂S₂O₃ (mol dm⁻³) <i>Concentration of sodium thiosulphate solution, Na₂S₂O₃ (mol dm⁻³)</i> $\frac{1}{\text{masa}}$ (s⁻¹) / $\frac{1}{\text{time}}$ (s⁻¹)	1 1 1																																				

	(d)	Semakin tinggi kepekatan larutan natrium tiosulfat, semakin tinggi kadar tindak balas. <i>The higher the concentration of sodium thiosulphate solution, the higher the rate of reaction.</i>	1
	(e)(i)	Tanda 'X' tidak kelihatan // Mendakan kuning terbentuk <i>'X' mark disappears from view // Yellow precipitate is formed</i>	1
	(ii)	Sulfur terbentuk / <i>Sulphur is formed</i>	1
	(f)(i)	Pemboleh ubah dimanipulasikan: Kepekatan natrium tiosulfat <i>Manipulated variable: Concentration of sodium thiosulphate</i>	1
	(ii)	Pemboleh ubah bergerak balas: Masa yang diambil untuk tanda 'X' tidak kelihatan // Kadar tindak balas <i>Responding variable: Time taken for 'X' mark to disappear from view // Rate of reaction</i>	1
	(iii)	Pemboleh ubah dimalarkan: Isi padu natrium tiosulfat // Saiz kelalang kon // Suhu <i>Fixed variable: Volume of sodium thiosulphate // Size of conical flask / Temperature</i>	1
	(g)	Masa yang diambil untuk tanda 'X' tidak kelihatan <i>Time taken for 'X' mark to disappear</i>	1
	(h)	P1 Masa yang diambil untuk tanda 'X' tidak kelihatan menjadi lebih lama <i>Time taken for 'X' mark to disappear from view is longer</i> P2 Keluasan dasar kelalang kon 250 cm ³ lebih besar // Kurang mendakan untuk menutupi tanda 'X' <i>Base area of 250 cm³ conical flask is bigger // Less precipitate to cover 'X' mark</i>	1 1