

SULIT

4541/3(PP)

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Chemistry
Kertas 3
Oktober
2021



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PEPERIKSAAN AKHIR SIJIL PENDIDIKAN MRSM 2021

CHEMISTRY

Kertas 3

Peraturan Pemarkahan

Untuk Kegunaan Pemeriksa Sahaja

Peraturan Pemarkahan ini mengandungi 3 halaman bercetak

Mark Scheme

No.	Answer	Mark	Total mark												
(a)	<p>[SK0112] Mengeksperimen <i>verb + material + apparatus (depends)</i> <i>// rub</i></p> <p>P1. Clean the copper strips, X strip, Y strip and Z strip by using <u>sandpaper</u>. <i>1</i></p> <p>P2. Pour 1.0 mol dm⁻³ copper(II) sulphate solution into a beaker until half full. <i>25 cm³ (cudu mesti tak exceed 50 cm³)</i> <i>1</i></p> <p>P3. Connect the copper strip and X strip to the voltmeter using <u>connecting wire with crocodile clip</u>. <i>1</i></p> <p>P4. Dip the copper strip and X strip into the copper(II) sulphate solution to complete the circuit. <i>a: (not using the solution)</i> <i>1</i></p> <p>P5. Record the voltmeter reading, metal at the negative terminal and metal at the positive terminal. <i>1</i></p> <p>P6. Repeat step 2 to 5 by using Y strip and Z strip to replace the X strip. <i>1</i></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	6												
(b) (i)	<p>[SK0101] Memerhati <i>// needle</i></p> <ul style="list-style-type: none"> The voltmeter pointer deflected Voltmeter shows a reading <p>Note: any one answer</p>	<p>1</p> <p>1</p>													
(b) (ii)	<p>[SK0104] Membuat inferens</p> <ul style="list-style-type: none"> Electrical current is produced Electron transfer occurs There is a potential difference between two metals <p>Note: Any one answer</p>	<p>1</p>	1												
(c)	<p>[SK0106] Berkomunikasi</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Pair of metal</th> <th>Voltage, V</th> <th>Negative terminal</th> </tr> </thead> <tbody> <tr> <td>X/Cu</td> <td>* 1.6</td> <td>X</td> </tr> <tr> <td>Y/Cu</td> <td>* 0.1</td> <td>Y</td> </tr> <tr> <td>Z/Cu</td> <td>* 0.7</td> <td>Z</td> </tr> </tbody> </table> <p>1. Heading MV is labelled (pair of metal) and heading for RV is labelled (<u>Voltage</u>, negative terminal) <i>1</i></p> <p>2. List of pair of metal <i>unit</i> <i>1</i></p> <p>3. Record the voltage <i>// voltmeter ready</i> <i>1</i></p> <p>4. Record the terminal <i>1</i></p> <p>Note: Voltage readings are based on teacher's results ± 0.1 V</p>	Pair of metal	Voltage, V	Negative terminal	X/Cu	* 1.6	X	Y/Cu	* 0.1	Y	Z/Cu	* 0.7	Z	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	4
Pair of metal	Voltage, V	Negative terminal													
X/Cu	* 1.6	X													
Y/Cu	* 0.1	Y													
Z/Cu	* 0.7	Z													

measure

Add //

Immerse //
(r: fully immerse)

record the voltmeter reading and metal at negative terminal

a: kelau pair voltmeter & copper (II) solution

r: copper (II) sulphate solution

r: brown deposited → not lead to claim of the question

X: magnesium
Y: tin
Z: zinc

a: 1.5, 1.7
a: 0.2
a: 0.6, 0.8

ada 2 voltage negative terminal P3 & P4 only

No.	Answer	Mark	Total mark
(d)	[SK0111] Membuat hipotesis The pair of metals with greater difference in <u>standard electrode potential</u> will produce greater voltage/voltmeter reading	1	1
(e)	[SK0108] Mentafsir data X, Z, Y and copper ^{Cu}	1	1
(f)	[SK0105] Meramal [voltage (X/Cu) – voltage (Y/Cu)] = [answer] V Note: Refers to student's answer in the table in 1(c)	1	1
Total			15

r: longer
longer

****END OF MARK SCHEME****

X-Y