



MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA  
CAWANGAN NEGERI SEMBILAN

PEPERIKSAAN PERCUBAAN BERSAMA  
SIJIL PELAJARAN MALAYSIA 2011

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CHEMISTRY

KERTAS 3

PERATURAN PEMARKAHAN

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UNTUK KEGUNAAN PEMERIKSA SAHAJA

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Peraturan pemarkahan ini mengandungi halaman 13 bercetak

## 1(a)(i)

Score	Rubric
3	[ Able to compare the observations correctly]  Sample answer : Temperature change in Experiment I is higher than in Experiment II
2	[Able to compare the observation]  Sample answer : Temperature change in Experiment I is high
1	[Able to state the change of temperature ]  Sample answer : Temperature change
0	No response or wrong response

## 1(a)(ii)

Score	Rubric
3	[ Able to state an inference correctly]  Sample answer : Heat produced in Experiment I is more than in Experiment II
2	[Able to state an inference]  Sample answer : Heat produced in Experiment I and in Experiment II
1	[Able to state the idea of inference]  Sample answer : Exothermic
0	No response or wrong response

(b)

Score	Rubric
3	[Able to write all temperatures with one decimal place correctly]  Answer :  43.0 37.0 27.0 27.0 16.0 10.0
2	[Able to write all the temperature without one decimal place]
1	[Able to at least two readings correctly]
0	No response or wrong response

(c)

Score	Rubric
3	[Able to state the variables correctly]  Sample answer : (i) The manipulated variable: zinc and magnesium powder  (ii) The responding variable: Initial temperature and highest temperature// change in temperature  (iii) The fixed variable: Volume and concentration of copper(II) sulphate solution
2	[Able to state two variables correctly].
1	[Able to state one variable correctly].
0	No response or wrong response

(d)

Score	Rubric
3	<p>[Able to give the hypothesis accurately by stating the following three aspects]</p> <ul style="list-style-type: none"> <li>-The manipulated variable: zinc and magnesium powder</li> <li>-effect that is related to the responding variable: heat of displacement of copper</li> <li>-direction of the effect greater or smaller</li> </ul> <p>Sample answer : Magnesium reacts with copper(II) sulphate solution produce more heat than in zinc reacts with copper(II) sulphate solution</p>
2	<p>[[Able to give the hypothesis accurately by stating any two of the aspects]</p> <p>Sample answer : More heat produced in magnesium</p>
1	<p>[Able to give an idea ]</p> <p>Sample answer : Heat is produced</p>
0	No response or wrong response

(e)

Score	Rubric
3	<p>[Able to write all <b>eight</b> values correctly in the calculation]</p> <p>Answer :</p> <p>Experiment I</p> <p>Heat released</p> $= mc\theta$ $= 50 \times 4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1} \times 16 \text{ }^\circ\text{C}$ $= 3360 \text{ J}$ <p>Heat of displacement of copper</p> $= 3.36 / 0.01 \text{ kJ}$ $= 336 \text{ kJ mol}^{-1}$ <p>Experiment II</p> <p>Heat released</p> $= mc\theta$ $= 50 \times 4.2 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1} \times 10 \text{ }^\circ\text{C}$ $= 2100 \text{ J}$ <p>Heat of displacement of copper</p> $= 2.1 / 0.01 \text{ kJ}$ $= 210 \text{ kJ mol}^{-1}$
2	[Able to write 4 to 7 values correctly in the calculation]
1	[Able to write 3 values correctly in the calculation]
0	No response or wrong response

(f)

Score	Rubric
3	<p>[ Able to state a correct reason of why the value of heat of displacement of copper are different based on the electrochemical series]</p> <p>Sample answer : Heat of displacement in Experiment I is higher because magnesium is higher than copper in electrochemical series.</p>
2	<p>[ Able to state a reason of why the value of heat of displacement of copper are different based on the electrochemical series]</p> <p>Sample answer : Magnesium is higher than copper in electrochemical series.</p>
1	<p>[Able to give an idea ]</p> <p>Sample answer : Heat of displacement in Experiment I is higher</p>
0	No response or wrong response

(g)

Score	Rubric
3	<p>[Able to state the operational definition correctly]</p> <ol style="list-style-type: none"> <li>1. how to operate the experiment</li> <li>2. observation</li> <li>3. state the mole of the substance replaced</li> </ol> <p>Sample answer : Temperature change is <math>16^{\circ}\text{C}</math> // Temperature rises when excess of magnesium powder is added to copper(II) sulphate solution to displace 1 mole of copper.</p>
2	<p>[Able to state the operational definition]</p> <ol style="list-style-type: none"> <li>1. how to operate the experiment</li> <li>2. observation</li> </ol> <p>Sample answer : Temperature change is <math>16^{\circ}\text{C}</math> // Temperature rises when excess of magnesium powder is added to copper(II) sulphate solution</p>
1	<p>[Able to state the operational definition]</p> <ol style="list-style-type: none"> <li>1. how to operate the experiment or</li> <li>2. observation</li> </ol> <p>Sample answer : Temperature rises</p>
0	No response or wrong response

2 (a)

Score	Rubric
3	[Able to draw a graph correctly]  1 Both axes are labelled with units. 2 Transfer all the points correctly. 3 Plot a correct curve.
2	[Able to draw a graph]  1 Both axes are labelled without units. 2 Transfer 4 points correctly. 3 Plot a correct curve.
1	[Have an idea to draw a graph]  1 Plot a correct curve.
0	No response or wrong response

(b)

Score	Rubric
3	[ Able to state the relationship correctly ]  Sample answer : The higher the concentration of hydroxide ions, the higher the pH value.
2	[Able to give incomplete relationship]  Sample answer : The concentration of hydroxide ions is directly proportionally to the pH value.
1	[Able to give an idea ]  Sample answer : The concentration of hydroxide ions affect the pH value
0	No response or wrong response



(c)

Score	Rubric
3	[Able to predict the pH value accurately]  1 Extrapolate the graph. 2 State the pH value.  Answer: 8.9
2	[Able to predict the pH value]  1 State the pH value.  Sample answer: 8.9 to 9.0
1	[Have an idea to predict the pH value]  Sample Answer : More than 8.8
0	No response or wrong response

## 3 (a) - Problem statement

Score	Rubric
3	[ Able to give the problem statement correctly ]  Sample answer : Does hexene decolouried bromine water?
2	[ Able to give the statement of problem incorrectly ]  Sample answer: Does unsaturated hydrocarbon decolouried bromine water?
1	[ Able to state an idea the statement of problem ]  Sample answer: Does hexane/ unsaturated hydrocarbon changes bromine water colour?
0	[ No response or wrong response ]

## 3 (b) - Variables

Score	Rubric
3	[ Able to state all variables correctly ]  Sample answer: Manipulated variable : Types of hydrocarbon/ Hexane and Hexene Responding variable : colour changes Constant variable : volume of bromine water// volume of hydrocarbons
2	[ Able to state any two variables correctly ]
1	[ Able to state any one variables correctly ]
0	[ No response or wrong response ]

## 3 (c) - Hypothesis

Score	Rubric
3	[Able to give the hypothesis accurately]  Sample answer: Hexene decolourised brown bromine water/ changes brown bromine water to colourless but Hexane does not decolourised brown bromine water/ brown bromine water remains unchanged.
2	[Able to give the hypothesis almost accurately]  Sample answer: Unsaturated hydrocarbon decolourised brown bromine water/ changes brown bromine water to colourless but saturated hydrocarbon does not decolourised brown bromine water/ brown bromine water remains unchanged.
1	[Able to state an idea of hypothesis]  Sample answer: Hexene /Unsaturated hydrocarbon decolourised brown bromine water/ changes brown bromine water to colourless // Hexane /saturated hydrocarbon does not decolourised brown bromine water/ brown bromine water remains unchanged.// Different hydrocarbon give different observation.
0	No response or wrong response

## 3(d) - Apparatus and materials

Score	Rubric
3	[ Able to give the list of the apparatus and substances correctly and completely] Answer: <i>Apparatus</i> : 1. test tube 2. dropper 3. Measuring cylinder  <i>Materials</i> : Bromine water, Hexane and Hexene.
2	[ Able to give the list of the apparatus and substances correctly and but not completely] Answer: Apparatus : <b>1 and 2.</b> Materials : At least one named hydrocarbon and bromine water.
1	[ Able to give an idea about the list of the apparatus and materials correctly] Answer: Test tube, bromine water and one named hydrocarbon.
0	[No response or wrong response].

## 3 (e) - Procedure of the experiment

Score	Rubric
3	[ Able to state all procedures correctly ]  Sample answer : 1. Add / pour / place [2 cm <sup>3</sup> – 5 cm <sup>3</sup> ] of Hexane into a test tube. 2. Add 3 drops of bromine water. 3. Observe and record the colour changes. 4. Repeat steps 1 to 3 using Hexene.
2	[ Able to state 3 steps of procedures correctly ]  Sample answer: Steps 1,2,3.
1	[ Able to state 2 steps of procedures correctly ]  Sample answer: Steps 1,2.
0	[No response or wrong response]

## 3 (f) - Tabulation of data

Score	Rubric						
2	[ Able to exhibit the tabulation of data correctly ]  Sample answer: <table border="1" data-bbox="384 1361 1187 1473"> <thead> <tr> <th>Hydrocarbon</th> <th>observation</th> </tr> </thead> <tbody> <tr> <td>Hexane</td> <td></td> </tr> <tr> <td>Hexene</td> <td></td> </tr> </tbody> </table>	Hydrocarbon	observation	Hexane		Hexene	
Hydrocarbon	observation						
Hexane							
Hexene							
1	[ Able to exhibit the tabulation of data less accurately ] Tabulation of data has 2 columns and 3 rows  Sample answer: <table border="1" data-bbox="384 1637 1187 1711"> <thead> <tr> <th>Hydrocarbon</th> <th>observation</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Hydrocarbon	observation				
Hydrocarbon	observation						
0	[No response or wrong response]						

Total (3 × 5) + 2 = 17

END OF MARK SCHEME