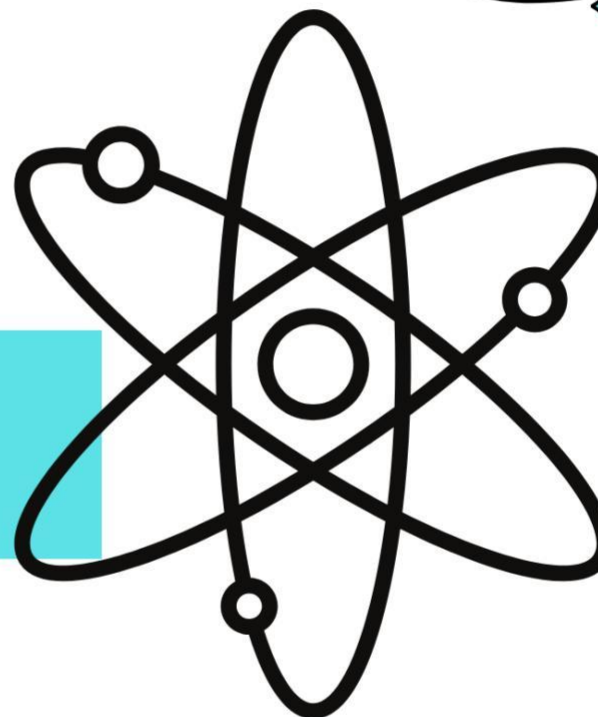


SET PECUTAN KIMIA

F4 BAB 3



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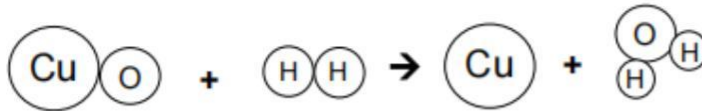
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Asas

Rajah 1 menunjukkan tindak balas antara kuprum(II) oksida dan gas hidrogen.
Diagram 1 shows reaction between copper(II) oxide and hydrogen gas.



Rajah 1
Diagram 1

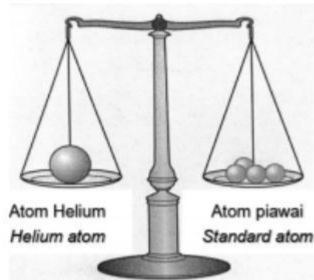
- (a) Nyatakan formula kimia bagi kuprum(II) oksida dan gas hidrogen.
State the chemical formula of copper(II) oxide and hydrogen gas.
- Kuprum(II) oksida :
Copper(II) oxide
Gas hidrogen :
Hydrogen gas
- [2 markah/ marks]
- (b) Nyatakan warna bagi kuprum(II) oksida.
State the colour of copper(II) oxide.
-
- [1 markah/ mark]
- (c) Nyatakan maklumat kualitatif dan kuantitatif berdasarkan Rajah 1.
State the qualitative and quantitative information based on Diagram 1.
-
-
- [2 markah/ marks]

(a)	<p>[Dapat menyatakan formula kimia bagi kuprum(II) oksida dan hydrogen dengan betul] <u>Jawapan:</u></p> <p>Kuprum(II) oksida : CuO Hidrogen : H₂</p>	1 1	2
(b)	<p>[Dapat menyatakan warna bagi kuprum(II) oksida dengan betul] <u>Jawapan:</u></p> <p>Hitam // black</p>	1	1
(c)	<p>[Dapat menyatakan maklumat kualitatif dan kuantitatif dengan betul] <u>Contoh jawapan:</u></p> <p>Kualitatif</p> <p>1. Kuprum(II) oksida bertindak balas dengan hidrogen menghasilkan kuprum dan air // <i>Copper(II) oxide reacts with hydrogen to produce copper and water</i></p> <p>Kuantitatif</p> <p>2. 1 mol kuprum(II) oksida bertindak balas dengan 1 mol gas hidrogen menghasilkan 1 mol kuprum dan 1 mol air // <i>1 mol of copper(II) oxide reacts with 1 mol of hydrogen gas to produce 1 mol of copper and 1 mol of water</i></p> <p>Nota :</p> <p>1. Point 1 dalam Point 2</p>	1 1	2

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Diagram 1 shows concept of relative atomic mass by comparing the mass of atom of an element to the mass of atom of another element that is chosen as the standard atom. The relative atomic mass of Helium is 4. This means the average mass of one atom of Helium is 4 time the mass of $\frac{1}{12}$ of standard atom.

Rajah 1 menunjukkan konsep jisim atom relatif dengan membandingkan jisim atom sesuatu unsur dengan jisim atom unsur lain yang dipilih sebagai atom piawai. Jisim atom relatif Helium ialah 4. Hal ini bermakna jisim purata satu atom Helium adalah 4 kali $\frac{1}{12}$ jisim atom piawai.



(a) Based on Diagram above,
 Berdasarkan rajah di atas,

(i) Define relative atomic mass
 Definisikan jisim atom relatif

[1 mark]

(ii) Name the element that is used as standard atom
 Namakan unsur yang digunakan sebagai atom piawai

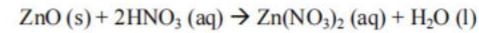
[1 mark]

(iii) State one reason why the element stated in (ii) is chosen
 Nyatakan satu sebab kenapa unsur yang dinyatakan di (a)(ii) dipilih

[1 mark]

(b) Chemical equation below shows a reaction between metal oxide and acid

Persamaan kimia di bawah menunjukkan tindak balas antara suatu oksida logam dan asid.



State one qualitative information and one quantitative information that can be obtained from the chemical equation

Nyatakan satu maklumat kualitatif dan satu maklumat kuantitatif yang boleh diperolehi daripada persamaan tersebut.

[2 marks]

(a)(i)	Average mass of an atom of the element compared to 1/12 of the mass of one carbon-12 atom	1
(a)(ii)	Carbon- 12	1
(a)(iii)	Carbon is in solid state // easy to handle// The natural abundance is 99%	1
(b)	Qualitative Nitric acid and zinc oxide are reactants while zinc nitrate and water are products Quantitative: 2 moles of nitric acid reacts with 1 mole of zinc oxide to produce 1 mole of zinc nitrate and 1 mole of water	1

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Rajah 6 menunjukkan sejenis bahan bom mandian yang diperbuat daripada 2 bahan: natrium bikarbonat, NaHCO_3 dan asid sitrik, $\text{C}_6\text{H}_8\text{O}_7$. Garam natrium sitrat, $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$ dihasilkan dengan gas karbon dioksida dan air.

Diagram 6 shows a type of bath bomb made from 2 materials: sodium bicarbonate, NaHCO_3 and citric acid, $\text{C}_6\text{H}_8\text{O}_7$. Sodium citrate salt, $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$, is produced along with carbon dioxide gas and water.



Rajah 6
Diagram 6

Persamaan kimia bagi tindak balas antara dua bahan tersebut adalah seperti berikut:
The chemical equation for the reaction between the two substances is as follows:



- (a) Seimbangkan persamaan kimia pada ruangan kotak yang disediakan.
Balance the chemical equation in the boxes provided.

[2 markah]
[2 marks]

- (b) Nyatakan maklumat kualitatif dan maklumat kuantitatif yang boleh diperolehi daripada persamaan tersebut.
State qualitative information and quantitative information that can be obtained from the chemical equation.

.....
.....
.....

[3 markah]

- (c) Maira menggunakan 2.52 g natrium bikarbonat, NaHCO_3 untuk bertindak balas dengan asid sitrik, $\text{C}_6\text{H}_8\text{O}_7$ bagi menghasilkan bom mandian.

Hitung jisim asid sitrik, $\text{C}_6\text{H}_8\text{O}_7$ yang perlu digunakan.
[Jisim atom relatif: H = 1, C = 12, O = 16, Na = 23]

Maira used 2.52 g of sodium bicarbonate, NaHCO_3 to be reacted with citric acid, $\text{C}_6\text{H}_8\text{O}_7$ to make the bath bomb.

Calculate the mass of the citric acid, $\text{C}_6\text{H}_8\text{O}_7$ that needs to be used.
[Relative atomic mass: H = 1, C = 12, O = 16, Na = 23]

(a)	$3\text{NaHCO}_3 + \text{C}_6\text{H}_8\text{O}_7 \rightarrow \text{Na}_3\text{C}_6\text{H}_5\text{O}_7 + 3\text{CO}_2 + 3\text{H}_2\text{O}$ P1 : correct balancing of reactants P2 : correct balancing of products	2
(b)	P1: Bahan tindak balas = natrium bikarbonat dan asid sitrik P2: Produk = natrium sitrat, karbon dioksida, dan air P3: 3 mol NaHCO_3 bertindak balas dengan 1 mol $\text{C}_6\text{H}_8\text{O}_7$ menghasilkan 1 mol $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$, 3 mol CO_2 , dan 3 mol H_2O P1 : Reactants = sodium bicarbonate and citric acid P2 : Products = sodium citrate, carbon dioxide and water P3 : 3 mol of NaHCO_3 reacts with 1 mol of $\text{C}_6\text{H}_8\text{O}_7$ producing 1 mol of $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$, 3 mol of CO_2 and 3 mol of H_2O	3
(c)	1. Bil mol natrium bikarbonat = Jisim / JMR = 2.52/84 = 0.03 mol 2. Nisbah mol 3 mol NaHCO_3 bertindak balas dengan 1 mol $\text{C}_6\text{H}_8\text{O}_7$ 0.03 mol NaHCO_3 bertindak balas dengan 0.01 mol $\text{C}_6\text{H}_8\text{O}_7$ 3. Jisim asid sitrik = mol x JMR = 0.01 x 192 = 1.92 g *Award 1 mark for RMM of $\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$	1 1 1 1

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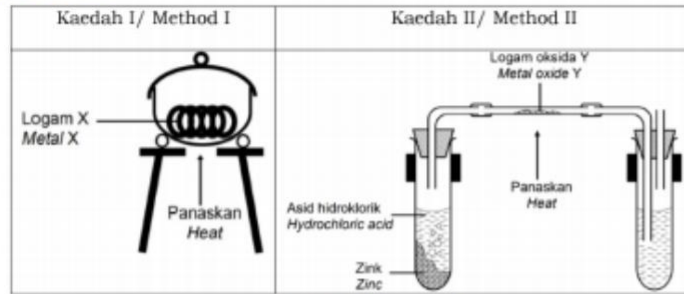
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Formula empirik

Rajah 4 menunjukkan dua kaedah yang digunakan untuk menentukan formula empirik bagi oksida logam X dan oksida logam Y.
Diagram 4 shows two methods used to determine the empirical formula for metal oxide X and metal oxide Y.



Rajah 4 / Diagram 4

(a) Apakah maksud formula empirik?
What is meant by empirical formula?

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

(b) Berdasarkan Rajah 4, cadangkan kaedah yang manakah sesuai digunakan untuk menentukan formula empirik bagi
Based on figure 4, suggest which method is suitable to use to determine the empirical formula for

Magnesium oksida :
Magnesium oxide

Oksida plumbum :
Lead oxide

[2 markah/marks]

(ii) Gas hidrogen dialirkan selama 10 saat sebelum pemanasan dimulakan. Jelaskan mengapa
Hydrogen gas is flowed for 10 seconds before heating is started. Explain why.

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

(c) Jadual 1 menunjukkan maklumat yang diperolehi dari satu eksperimen menggunakan kaedah II dalam Rajah 4.
Table 1 shows the information obtained from an experiment using Method II in Diagram 4.

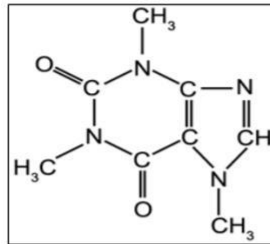
Perkara / Description	Jisim / Mass (g)
Salur kaca Glass tube	4.128
Salur kaca + oksida logam Y Glass tube + oxide of metal Y	4.318
Salur kaca + logam Y Glass tube + metal Y	4.280

Jadual 1 / Table 1

(i) Tentukan formula empirik bagi oksida Y.
Determine the empirical formula for oxide Y.
[Jisim atom relatif / Relative atomic mass : O = 16, Y = 64]

(a)	Formula kimia yang menunjukkan nisbah paling ringkas bilangan atom setiap jenis unsur dalam sesuatu sebatian. Chemical formula that shows the simplest ratio of the number of atoms of each element in a compound.												
(b)	Magnesium oksida : Kaedah 1 / I Plumbum(II) oksida : Kaedah 2 / II												
(c) (i)	<table border="1"> <thead> <tr> <th></th> <th>Logam Y</th> <th>Oksigen</th> </tr> </thead> <tbody> <tr> <td>Jisim (g)</td> <td>0.152</td> <td>0.038</td> </tr> <tr> <td>Bil. Mol</td> <td>$\frac{0.152}{64} = 0.0024$</td> <td>$\frac{0.038}{16} = 0.0024$</td> </tr> <tr> <td>Nisbah mol</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>Formula empirik : YO</p>		Logam Y	Oksigen	Jisim (g)	0.152	0.038	Bil. Mol	$\frac{0.152}{64} = 0.0024$	$\frac{0.038}{16} = 0.0024$	Nisbah mol	1	1
	Logam Y	Oksigen											
Jisim (g)	0.152	0.038											
Bil. Mol	$\frac{0.152}{64} = 0.0024$	$\frac{0.038}{16} = 0.0024$											
Nisbah mol	1	1											
(c)(ii)	Gas hidrogen dialirkan pada awal eksperimen untuk menyingkirkan sebarang gas yang terdapat dalam salur kaca. Hydrogen gas is flowed at the beginning of the experiment to remove any gas present in the glass tube. r : letupan berlaku												

Rajah 2 menunjukkan formula struktur bagi kafeina.
Diagram 2 shows the structural formula of caffeine.



Rajah 2 / Diagram 2

- (a) Apakah maksud formula molekul?
What is the meaning of molecular formula?

[1 markah / mark]

- (b) Berdasarkan Rajah 2,
Based on Diagram 2,
(i) Namakan semua unsur yang terdapat dalam kafeina.
Name all the elements present in caffeine.

[1 markah / mark]

- (ii) Tuliskan formula molekul dan formula empirik bagi kafeina.
Write the molecular and empirical formula of caffeine.

Formula molekul bagi kafeina <i>Molecular formula of caffeine</i>	Formula empirik bagi kafeina <i>Empirical formula of caffeine</i>

[2 markah / marks]

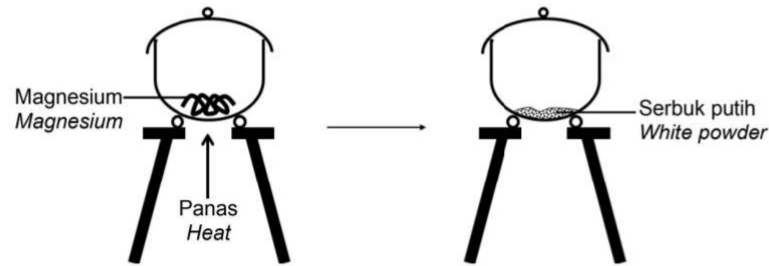
- (c) Nyatakan jenis zarah yang wujud dalam kafeina.
State the type of particle exist in caffeine.

[1 markah / mark]

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(a)		Formula kimia yang menunjukkan bilangan sebenar atom setiap jenis unsur yang terdapat di dalam satu molekul sesuatu sebatian. <i>Chemical formula that shows the actual number of atoms of each element found in a molecule of a compound.</i>		1				
(b)	(i)	Karbon, hidrogen, oksigen, nitrogen <i>Carbon, hydrogen, oxygen, nitrogen</i>		1				
	(ii)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Formula molekul bagi kafeina <i>Molecular formula of caffeine</i></th> <th style="width: 50%; text-align: center;">Formula empirik bagi kafeina <i>Empirical formula of caffeine</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">C₈H₁₀N₄O₂</td> <td style="text-align: center;">C₄H₅N₂O</td> </tr> </tbody> </table>	Formula molekul bagi kafeina <i>Molecular formula of caffeine</i>	Formula empirik bagi kafeina <i>Empirical formula of caffeine</i>	C ₈ H ₁₀ N ₄ O ₂	C ₄ H ₅ N ₂ O	1+1	2
Formula molekul bagi kafeina <i>Molecular formula of caffeine</i>	Formula empirik bagi kafeina <i>Empirical formula of caffeine</i>							
C ₈ H ₁₀ N ₄ O ₂	C ₄ H ₅ N ₂ O							
(c)		Molekul <i>Molecule</i>		1				

Rajah 3 menunjukkan perubahan yang berlaku semasa aktiviti menentukan formula empirik bagi oksida logam magnesium.
Diagram 3 shows the changes that occur during the activity of determining the empirical formula for magnesium metal oxide.



Rajah 3
Diagram 3

- (c) Tentukan bilangan mol serbuk putih yang akan terhasil jika 0.5 mol oksigen telah digunakan untuk memastikan pembakaran telah lengkap berlaku.
Determine the number of moles of white powder that would be produced if 0.5 moles of oxygen were used to ensure complete combustion.

- (a) Tuliskan formula kimia bagi serbuk putih
Write the chemical formula for the white powder

[1 markah]
[1 mark]

- (b) (i) Tuliskan persamaan kimia bagi tindak balas yang ditunjukkan dalam Rajah 3
Write the chemical equation for the reaction shown in Diagram 3

[2 markah]
[2 marks]

- (ii) Nyatakan dua maklumat secara kualitatif dan kuantitatif yang dapat diperolehi dari persamaan kimia di (b)(i)
State two information qualitatively and quantitatively that can be obtained from the chemical equation in (b)(i)

[2 markah]
[2 marks]

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No	Cadangan Jawapan	Mark
(a).	MgO	1
(b)	$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$	2
	2 mol magnesium bertindak balas dengan 1 mol oksigen menghasilkan 1 mol magnesium oksida	2
(c)	1 mol oksigen hasilkan 2 mol magnesium oksida 0.5 mol oksigen hasilkan 1 mol magnesium oksida	1

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Jadual 4 menunjukkan persamaan bagi dua tindak balas melibatkan oksida logam P dan logam Q. Formula empirik bagi oksida P dan oksida Q ditentukan melalui Kaedah I dan Kaedah II.

Table 4 shows the equations for two reactions involving oxide of metal P and metal Q. The empirical formulae of P oxide and Q oxide are determined through Method I and Method II.

Kaedah Method	Persamaan Equation
I	$H_2 + PO \rightarrow P + H_2O$
II	$2Q + O_2 \rightarrow 2QO$

Jadual / Table 4

(a) Apakah yang dimaksudkan dengan formula empirik?

What is meant by empirical formula?

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

(b) Cadangkan nama logam Q.

Suggest name of metal Q.

.....
[1 markah / mark]

(c) Apabila 4.5 g unsur Q terbakar dengan lengkap menghasilkan 7.5 g oksida Q. Apakah formula empirik bagi oksida logam tersebut?

[Jisim atom relatif : Q = 24, O = 16]

When 4.5 g of element Q is burnt completely forming 7.5 g of oxide of Q. What is the empirical formula of the metal oxide?

[Relative atomic mass : Q = 24, O = 16]

(d) Kaedah yang manakah lebih sesuai digunakan untuk menentukan formula empirik bagi kuprum(II) oksida, CuO? Terangkan.

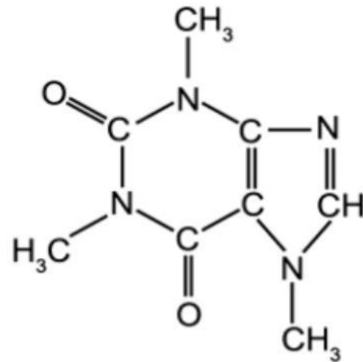
Which method is suitable to be used to determine the empirical formula of copper(II) oxide, CuO? Explain.

.....
.....
[2 markah / marks]

No. Soalan	jawapan	Markah												
(a)	Formula kimia yang menunjukkan nisbah paling ringkas atom setiap jenis unsur dalam sesuatu sebatian // <i>Chemical formula that shows the simplest ratio of atoms of each element in a compound</i>	1												
(b)	Magnesium // Zink <i>Magnesium // Zinc</i> r : Mg / Zn / Aluminium / Al	1												
(c)	P1: Jisim oksigen // <i>Mass of oxygen = 7.5 - 4.5 = 3.0 g</i> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Unsur Element</th> <th>Q</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>Jisim (g) <i>Mass (g)</i></td> <td>4.5</td> <td>3.0</td> </tr> <tr> <td>P2: Bilangan mol (mol) <i>Number of mole (mol)</i></td> <td>$\frac{4.5}{24} = 0.1875$</td> <td>$\frac{3.0}{16} = 0.1875$</td> </tr> <tr> <td>P3: Nisbah <i>Ratio</i></td> <td>1</td> <td>1</td> </tr> </tbody> </table> P4: Formula empirik // <i>Empirical formula = QO</i>	Unsur Element	Q	O	Jisim (g) <i>Mass (g)</i>	4.5	3.0	P2: Bilangan mol (mol) <i>Number of mole (mol)</i>	$\frac{4.5}{24} = 0.1875$	$\frac{3.0}{16} = 0.1875$	P3: Nisbah <i>Ratio</i>	1	1	1
Unsur Element	Q	O												
Jisim (g) <i>Mass (g)</i>	4.5	3.0												
P2: Bilangan mol (mol) <i>Number of mole (mol)</i>	$\frac{4.5}{24} = 0.1875$	$\frac{3.0}{16} = 0.1875$												
P3: Nisbah <i>Ratio</i>	1	1												
(d)	P1: Kaedah I // <i>Method I</i> P2: Kuprum adalah logam yang kurang reaktif daripada hidrogen. // <i>Copper is a metal that is less reactive than hydrogen</i>	1 1												

Rajah 5.1 menunjukkan formula struktur bagi kafein yang boleh dijadikan sebagai baja semulajadi untuk tumbuhan.

Diagram 5.1 shows the structural formula of caffeine, which can be a natural fertiliser for plants.



Rajah 5.1
Diagram 5.1

- (a) (i) Nyatakan formula molekul kafein tersebut.
State the molecular formula of caffeine.

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

- (ii) Kira peratus nitrogen mengikut jisim dalam kafein.
Calculate the percentage of nitrogen by mass in caffeine.
[Jisim atom relatif : C = 12; H = 1; O = 16; N = 14]
[Relative atomic mass : C = 12; H = 1; O = 16; N = 14]

- (ii) Baja biasanya mempunyai kandungan nitrogen yang tinggi. Nitrogen diperlukan untuk meningkatkan tumbesaran tumbuhan seperti sayuran. Antara contoh baja yang digunakan oleh petani ialah urea, $\text{CO}(\text{NH}_2)_2$.

Fertilisers usually have a high content of nitrogen. Nitrogen is needed to enhance the growth of plants such as vegetables. Among the examples of fertilisers used by farmers are urea, $\text{CO}(\text{NH}_2)_2$.

Berdasarkan peratus nitrogen mengikut jisim dalam kafein di 5(a)(ii) dan urea, tentukan baja yang terbaik yang patut digunakan oleh petani untuk tanamannya. Jelaskan.

Based on the percentage of nitrogen by mass in caffeine in 5(a)(ii) and urea, determine the best fertilisers that should be used by farmers for their plants. Explain.

.....
.....

[2 markah]
[2 marks]

(a)	(i)	$\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$	1
	(ii)	Peratus jisim nitrogen dalam kafein Percentage of mass of nitrogen in caffeine $= \frac{14 \times 4}{(12 \times 8) + (1 \times 10) + (14 \times 4) + (16 \times 2)} \times 100\%$ $= \frac{56}{194} \times 100\%$ $= 28.87\%$	1 1
	(iii)	Baja urea adalah baja yang paling baik. Urea is the best fertiliser. Ini adalah kerana baja urea mengandungi peratus nitrogen mengikut jisim yang lebih tinggi berbanding kafein. This is because urea fertiliser contains a higher percentage of nitrogen by mass than caffeine.	1 1
(b)	(i)	Mengesan kehadiran gas karbon dioksida. To detect the presence of carbon dioxide gas.	1
	(ii)	$\text{CuCO}_3(\text{p/s}) \rightarrow \text{CuO}(\text{p/s}) + \text{CO}_2(\text{g})$	1 + 1

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- 6 (a) (i) Tuliskan formula untuk menunjukkan hubungan antara bilangan mol dan bilangan zarah untuk sesuatu bahan.

Write a formula to show the relationship between the number of moles and the number of particles for a substance.

Bilangan mol =
Number of moles

[1 markah/mark]

- (ii) Cari bilangan mol atom dalam satu sampel yang mengandungi 9.03×10^{20} atom zink.

[Pemalar Avogadro ialah $6.02 \times 10^{23} \text{ mol}^{-1}$]

Find the number of moles of atoms in a sample containing 9.03×10^{20} atoms of zinc.

[Avogadro constant is $6.02 \times 10^{23} \text{ mol}^{-1}$]

[1 markah/mark]

- (iii) Sebuah tangki mengandungi 2 mol gas sulfur trioksida. Berapakah bilangan atom oksigen dalam tangki itu?

[Isipadu molar gas pada suhu bilik ialah $24 \text{ dm}^3 \text{ mol}^{-1}$; Pemalar Avogadro ialah $6.02 \times 10^{23} \text{ mol}^{-1}$]

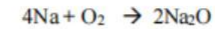
A tank contains 2 moles of sulphur trioxide gas. What is the number of oxygen atoms of in the tank?

[Molar volume of gas at room temperature is $24 \text{ dm}^3 \text{ mol}^{-1}$; Avogadro constant is $6.02 \times 10^{23} \text{ mol}^{-1}$]

[1 markah/mark]

- (b) Satu tindak balas diwakili oleh persamaan berikut:

A reaction is represented by the following equation:



Berdasarkan persamaan di atas, berikan

Based on the equation above, give

- (i) maklumat secara kualitatif
qualitative information

[1 markah/mark]

- (ii) maklumat kuantitatif dari segi entiti asas
quantitative information based on basic entities

[1 markah/mark]

- (c) Kuprum(II) oksida diturunkan oleh gas hidrogen membentuk air dan kuprum.

Copper(II) oxide is reduced by hydrogen gas to form water and copper.

- (i) Tuliskan persamaan tindak balas yang berlaku.

Write the equation of the reaction that takes place.

[1 markah/mark]

- (ii) Jika 8 g kuprum (II) oksida bertindak balas sempurna dengan gas hidrogen, hitungkan jisim kuprum yang terhasil. [Jisim atom relatif: O=16; Cu=64]
If 8 g of copper (II) oxide reacts completely with hydrogen gas, calculate the mass of copper produced. [Relative atomic mass: O = 16; Cu = 64]

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Set Pecutan Kimia 2024

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Bilangan mol = bilangan zarah / N_A <i>Number of mole = number of particles / N_A</i>	1	1	Bilangan mol/ <i>number of mole</i> CuO = $8 / 64 + 16 = 0.1$ mol Nisbah/ <i>ratio</i> : CuO : Cu 1 mol : 1mol 0.1 mol : 0.1 mol Jisim / <i>mass</i> Cu = $0.1 \times 64 = 6.4$ g	3
Bilangan mol atom Zn = $9.03 \times 10^{20} / 6.02 \times 10^{23}$ = $1.5 \times 10^{-3} = 0.0015$ mol <i>Number of mole of atoms</i> = $9.03 \times 10^{20} / 6.02 \times 10^{23}$ = $1.5 \times 10^{-3} = 0.0015$ mol	1	1		
Bilangan mol atom oksigen = $2 \times 4 \times 6.02 \times 10^{23}$ = 4.861×10^{24} mol <i>Number of mole of oxygen atoms</i> = $2 \times 4 \times 6.02 \times 10^{23}$ = 4.861×10^{24} mol	1	1		
Kualitatif/ <i>Qualitative</i> : Natrium bertindak balas dengan oksigen untuk menghasilkan natrium oksida <i>Sodium reacts with oxygen to produce sodium oxide</i> Kuantitatif/ <i>Quantitative</i> : 4 atom natrium bertindak balas dengan 1 molekul oksigen menghasilkan 2 unit Na ₂ O <i>4 sodium atoms reacts with 1 molecule of oxygen to produce 2 unit Na₂O</i>	1	1	2	
CuO + H ₂ → Cu + H ₂ O	1	1		

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