

BAB 3: KONSEP MOL, FORMULA DAN PERSAMAAN KIMIA

SOALAN OBJEKTIF

SPM 2009 Soalan 37

- 1 Jisim molekul relatif bagi $M_2(SO_4)_3$ ialah 342. Berapakah jisim atom relatif bagi unsur M?
[Jisim atom relatif: O = 16, S = 32]
The relative molecular mass of $M_2(SO_4)_3$ is 342. What is the relative atomic mass of element M?
[Relative atomic mass: O = 16, S = 32]
- A 27 B 54
C 118 D 123

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- 2 Jadual di bawah menunjukkan dua unsur dan jisim atom relatif masing – masing. Huruf yang digunakan bukan simbol sebenar unsur itu.
Table below shows two elements and their respective relative atomic mass. The letters used are not the actual symbol of the elements.

Unsur <i>Element</i>	Jisim atom relatif <i>Relative atomic mass</i>
X	24
M	12

Antara yang berikut, yang manakah benar tentang atom bagi unsur X dan unsur M?
Which of the following is true about the atom of elements X and M?

- A Jisim 1 mol X adalah dua kali jisim 1 mol M
The mass of 1 mol of X is twice the mass of 1 mol of M.
- B 1 mol X mempunyai jisim yang sama dengan 1 mol X
1 mol of X has the same mass as 1 mol of M
- C Jisim satu atom X ialah 24 g dan jisim satu atom M ialah 12 g
The mass of an atom of X is 24 g and the mass of an atom of M is 12 g.
- D Bilangan mol dalam 12 g atom X sama dengan bilangan mol dalam 12 g atom M.
The number of mole in 12 g of atom X is equal to the number of mole in 12 g of atom M.

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- 3 Berapakah bilangan mol kuprum(II) nitrat dalam 56.4 g kuprum (II) nitrat $Cu(NO_3)_2$?
[Jisim atom relatif : O = 16, Cu = 64, N = 14].
What is the number of moles of copper(II) nitrate in 56.4 g of copper(II) nitrate, $Cu(NO_3)_2$?
[Relative atomic mass: O = 16, Cu = 64, N = 14].
- A 0.30 mol B 0.32 mol
C 0.45 mol D 3.33 mol

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- 4 Antara zarah yang berikut, yang manakah bersamaan dengan 1 mol?

Which of the following particles equal to 1 mole?

- A Bilangan atom dalam 1 g gas hidrogen
The number of atom in 1 g of hydrogen gas
- B Bilangan molekul dalam 1 g gas hidrogen
The number of molecule in 1 g of hydrogen gas
- C 6.02×10^{23} atom hidrogen dalam gas hidrogen
 6.02×10^{23} of hydrogen atoms in hydrogen gas.
- D 6.02×10^{23} molekul hidrogen dalam gas hidrogen
 6.02×10^{23} of hydrogen molecule in hydrogen gas.

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- 5 Antara gas berikut, yang manakah mengandungi 0.4 mol atom pada suhu dan tekanan bilik?

[1 mol gas menempati isi padu sebanyak 24 dm³ pada suhu dan tekanan bilik]

Which of the following gases contains 0.4 mol of atoms at room temperature and pressure?

[1 mol of gas occupies the volume of 24 dm³ at room temperature and pressure]

- A 4.8 dm³ He
- B 4.8 dm³ H₂
- C 4.8 dm³ SO₃
- D 4.8 dm³ CO₂

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- 6 Apabila kuprum(II) karbonat, CuCO₃ dipanaskan, gas yang terbebas menukarkan air kapur menjadi keruh.

Berapakah isi padu gas yang terbebas apabila 0.62 g kuprum(II) karbonat dipanaskan pada keadaan bilik?

[Jisim atom relatif ; C = 12, O = 16, Cu = 64 ; Isipadu molar gas = 24 dm³ mol⁻¹ pada keadaan bilik]

When copper(II) carbonate, CuCO₃ is heated, the gas released turns the lime water chalky.

What is the volume of gas released when 0.62 g of copper(II) carbonate is heated at room condition?

[Relative atomic mass; C = 12, O = 16, Cu = 64; Molar volume of gas = 24 dm³ mol⁻¹ at room conditions]

- A 5 cm³
- B 120 cm³
- C 240 cm³
- D 360 cm³

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7. Formula bagi ion sulfat adalah SO₄²⁻ dan ion nitrat adalah NO₃⁻.

Jika formula garam sulfat bagi M ialah MSO₄, apakah formula garam nitrat bagi M?

The formula for a sulphate ion is SO₄²⁻ and for a nitrate is NO₃⁻.

If the formula of the sulphate salt of M is MSO₄, what is the formula of the nitrate salt of M?

- A MNO₃
- B M₂NO₃
- C M(NO₃)₂
- D M(NO₃)₃

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8 Sebatian manakah yang mempunyai formula yang betul?

Which compound has the correct formula?

	Sebatian <i>Compound</i>	Formula <i>Formula</i>
A	Barium Nitrat <i>Barium Nitrate</i>	Ba(NO ₃) ₂
B	Plumbum(II) oksida <i>Lead(II) oxide</i>	PbO ₂
C	Kuprum(II) oksida <i>Copper(II) oxide</i>	Cu ₂ O
D	Argentum karbonat <i>Silver carbonate</i>	AgCO ₃

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9 Persamaan kimia berikut menunjukkan pembakaran lengkap bagi gas etana

The following chemical equation shows the complete combustion of ethane gas.



Berapakah isipadu etana yang diperlukan untuk menghasilkan 2.2 g karbon dioksida pada suhu dan tekanan piawai?

[Jisim molar CO₂ = 44 gmol⁻¹. Isipadu molar gas pada suhu dan tekanan piawai = 22.4 dm³mol⁻¹]

What is the volume of ethane needed to produce 2.2 g of carbon dioxide at standard temperature and pressure?

[Molar mass of CO₂ = 44 gmol⁻¹. Molar volume of gas at standard temperature and pressure = 22.4 dm³mol⁻¹]

- | | | | |
|---|----------------------|---|----------------------|
| A | 0.05 dm ³ | B | 0.10 dm ³ |
| C | 0.56 dm ³ | D | 1.12 dm ³ |

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10 Persamaan berikut mewakili satu tindak balas.

The following equation represents a reaction.



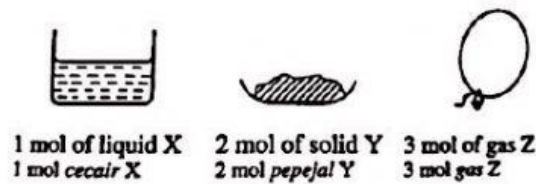
Apakah bahan – bahan tindak balas dalam persamaan ini?

What are the reactants in this equation?

- A Kuprum(II) nitrat dan air
Copper(II) nitrate and water
- B Kuprum(II) nitrat dan asid nitrik
Copper(II) nitrate and nitric acid
- C Kuprum(II) hidroksida dan asid nitrik
Copper(II) hydroxide and nitric acid
- D Kuprum(II) hidroksida dan kuprum(II) nitrat
Copper(II) hydroxide and copper(II) nitrate.

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- 11 Rajah 1 menunjukkan tiga jenis bahan.
Diagram 1 shows three types of substances.



Rajah 1 / Diagram 1

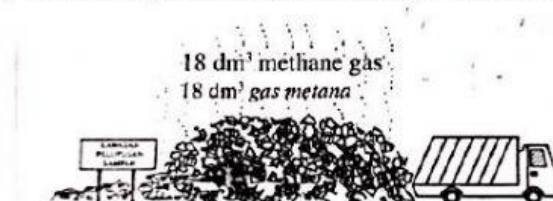
Antara yang berikut, yang manakah benar tentang bahan pada Rajah 1?

Which of the following is true about the substances in Diagram 1?

- I Bilangan zarah dalam gas Z ialah sebanyak $3 \times 6.02 \times 10^{23}$
The number of particles in gas Z is $3 \times 6.02 \times 10^{23}$
- II Bilangan zarah dalam pepejal Y adalah dua kali lebih banyak daripada bilangan zarah dalam cecair X.
The number of particles in solid Y is two times greater than in liquid X.
- III Bilangan zarah dalam cecair X adalah lebih daripada bilangan zarah dalam gas Z
The number of particles in liquid X is more than in a gas Z.
- IV Bilangan zarah dalam pepejal Y adalah lebih daripada bilangan zarah dalam gas Z
The number of particles in solid Y is more than in a gas Z.
- A I dan II
I and II
- B I dan III
I and III
- C II dan III
II and III
- D II dan IV
II and IV

SPM 2005 Soalan 39

- 12 Gambar rajah menunjukkan suatu kawasan pelupusan sampah.
Aktiviti mikroorganisma di kawasan itu menghasilkan gas metana (CH_4)
The picture shows a waste disposal site.
The activity of microorganisms in the waste produces methane (CH_4)



Berapakah jisim gas metana (CH_4) yang terhasil?

What is the mass of methane (CH_4) produced?

[Diberi jisim atom relatif, $\text{H} = 1$, $\text{C} = 12$ dan 1 mol gas menempati 24 dm^3 pada suhu dan tekanan bilik]

[Given that the relative atomic mass $\text{H} = 1$, $\text{C} = 12$ and 1 mol of gas occupies 24 dm^3 at room temperature and pressure]

- A 12 g
B 16 g
C 21 g
D 27 g