



MODUL KIMIA TINGKATAN 4 2018

SUMBER: CIKGU ADURA AZLIN ISHAK

Bilangan Mol

The mole

Definisi

Definition:

.....

.....

A. Bilangan Mol Dan Bilangan Zarah

The mole and The number of particle

1. Zarah adalah [Berikan definisi dan contoh untuk bahan-bahan di bawah]

Particle are : [Give the definitions and the example for the substances below]

Atom <i>Atom</i>	Molekul <i>Molecule</i>	Ion <i>Ion</i>

2. Formula

Formula :

Aktiviti A : Selesaikan semua soalan dibawah

Activity A : Solve all the question below.

Diberikan, nombor Avogadro ialah 6.02×10^{23}

Given the Avogadro constance is 6.02×10^{23}

1. Diberikan 0.2 mol gas oksigen. Kirakan

Given 0.2 mol of oxygen gas. Calculate the

a. Bilangan **molekul** oksigen

*Number of oxygen **molecules***

b. Bilangan **atom** oksigen

*Number of oxygen **atoms***

2. Diberikan 0.2 mol gas klorin. Kirakan
Given 0.2 mol of chlorine gas. Calculate the

a. Bilangan **molekul** klorin
*Number of **chlorine** molecules*

b. Bilangan **atom** klorin
*Number of **chlorine atoms***

3. Diberikan 9.03×10^{20} **atom** hidrogen. Kirakan
*Given 9.03×10^{20} **atoms of** hydrogen. Calculate the*

a. **Bilangan mol** atom hidrogen
***moles of** hydrogen atoms*

b. Bilangan mol molekul hidrogen
***moles of** hydrogen molecules*

4. Diberikan 4.214×10^{24} **atom** nitrogen. Kirakan
*Given 4.214×10^{24} **atoms** nitrogen. Calculate the*

a. Bilangan mol atom nitrogen
***moles of** nitrogen atoms*

b. Bilangan mol molekul nitrogen
***moles of** nitrogen molecules*

B. Bilangan Mol Dan Jisim

The Mole And The Mass

1. Formula

Formula:

2. Jisim Molar bagi

Molar mass for:

Atom <i>Atom</i>	Molekul <i>Molecule</i>	Ion <i>Ion</i>
Sama dengan Jisim Atom Relatif JAR [nombor Nukleon] <i>Equal to</i> Relative Atomic Mass RAM <i>[nucleon number]</i>	Sama dengan Jisim Molekul Relatif JMR <i>Equal to</i> Relative Molecule Mass RMM	Sama dengan Jisim Formula Relatif JFR <i>Equal to</i> Relative Formula Mass RFM
Contoh : Kirakan jisim untuk: <i>Example : Calculation the Mass for:</i>		
[Atom = nombor nukleon] <i>[atom = nucleon number]</i>	[Jumlah semua JAR atom di dalam molekul] <i>[Total all RAM of atom in molecule]</i>	[Jumlah semua JAR atom di dalam sebatian ion] <i>[Total all RAM of atom in ionik compound]</i>
i. Mg = ii. K = ii. Na =	i. H ₂ O = ii. CO ₂ = iii. O ₂ =	i. CuSO ₄ = ii. NaCl = iii. KBr =

Aktiviti B ; Selesaikan semua soalan di bawah:

Activity B : Solve all the question below.

1. Kirakan bilangan mol bahan berikut

Calculate the number of moles of the substance :

a. 4 g Kuprum(II) oksida, CuO
4 g of copper(II) oxide ,CuO
[JAR | RAM : Cu=64, O=16]

b. 2.5 Zink karbonat, ZnCO₃
2.5 g of zinc carbonate, ZnCO₃
[JAR | RAM : Zn=65, C=12; O=16]

Formula ion

Ionic formula

1. Sebatian ion terdiri dari ion bercas positif, Kation dan ion bercas negative, anion.

*Ionic compound are made up positively-charged ions, **cations** and negatively-charged ions, **anions**.*

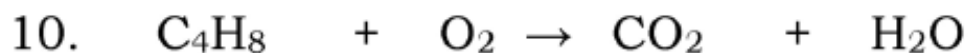
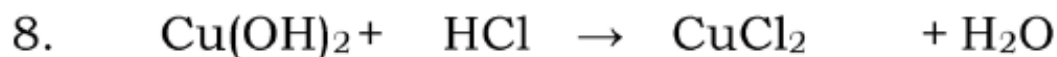
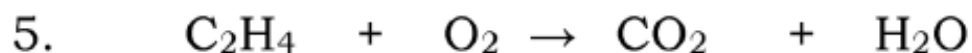
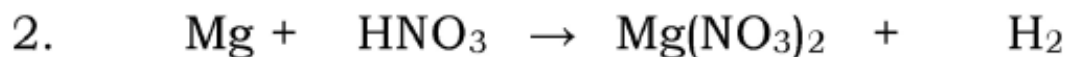
2. Kation dan anion

The cations and anions

Kation <i>Cations</i>		Anion <i>Anions</i>	
Nama Ion <i>Ion Name</i>	Formula <i>Formula</i>	Nama Ion <i>Ion Name</i>	Formula <i>Formula</i>
Kalium ion <i>Potassium ion</i>		Ion Fluorin <i>Fluoride ion</i>	
Ion Natrium <i>Sodium ion</i>		Ion Klorin <i>Chloride ion</i>	
Ion Hidrogen <i>Hydrogen ion</i>		Ion Bromida <i>Bromide ion</i>	
Ion Argentum <i>Silver ion</i>		Ion Iodida <i>Iodide ion</i>	
Ion Ammonium <i>Ammonium ion</i>		Ion Hidroksida <i>Hydroxide ion</i>	
Ion Litium <i>Lithium ion</i>		Ion Nitrat <i>Nitrate ion</i>	
Ion Rubidium <i>Rubidium ion</i>		Ion Manganase(VII) <i>Manganese (VII) ion</i>	
Ion Barium <i>Barium ion</i>		Ion Karbonat <i>Carbonate ion</i>	
Ion Kalsium <i>Calcium ion</i>		Ion Oksida <i>Oxide ion</i>	
Ion Nikel(II) <i>Nickel (II) ion</i>		Ion Sulfit <i>Sulphide ion</i>	
Ion Kuprum <i>Copper (II) ion</i>		Ion Sulfat <i>Sulphate ion</i>	
Ion Ferum(II) <i>Iron (II) ion</i>		Ion diKromat(VI) <i>Dichromate (VI) ion</i>	
Ion Plumbum(II) <i>Lead (II) ion</i>		Ion Kromat(VI) <i>Chromate (VI) ion</i>	
Ion Zink <i>Zinc ion</i>		Ion Fosfat <i>Phosphate ion</i>	
Ion Magnesium <i>Magnesium ion</i>			
Ion Aluminim <i>Aluminium ion</i>			
Ion Ferum(III) <i>Iron (III) ion</i>			

Aktiviti 2 : Seimbangkan persamaan kimia di bawah.

Activity 2 : Balance the chemical equations below.



Aktiviti 1 : Selesaikan masalah yang melibatkan persamaan*Activity 1: Numerical problems involving chemical equations*

Hitung jisim zink yang diperlukan untuk bertindak balas dengan asid hidroklorik untuk menghasilkan 6 dm³ gas hidrogen pada suhu bilik.

[RAM: Zn = 65, Cl = 35.5, gas 1 mol menempati 24 dm³ mol⁻¹ pada keadaan bilik] (Jwpn: 16.25g)

Calculate the mass for zinc required to react with hydrochloric acid to produce 6 dm³ hydrogen gas at room temperature

[RAM: Zn=65, Cl=35.5, 1 mole gas occupy 24 dm³ mol⁻¹ at room condition] (Ans : 16.25g)

Info / Info	Nisbah / Ratio	Selesaikan / Solve		
Formula mol		Formula mol		
			Info	Solve
	Formula			
	From eq.			
	From calculation			
	Statement / Pernyataan	Convert to <i>Tukarkan kepada</i>		
		Solve it <i>Selesaikan</i>		



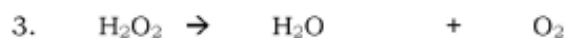
Hitung jisim kalium yang diperlukan untuk menghasilkan 23.5 g kalium oksida.

[JAR: K=39, O=16] (Jwpn: 19.5 g)

Calculate the mass of potassium required to produce 23.5 g potassium oxide.

[RAM: K=39, O=16] (Ans: 19.5 g)

Info / Info	Nisbah / Ratio	Selesaikan / Solve		
Formula mol		Formula mol		
			Info	Solve
	Formula			
	From eq.			
	From calculation			
	Statement / Pernyataan	Convert to <i>Tukarkan kepada</i>		
		Solve it <i>Selesaikan</i>		



(i) Seimbangkan persamaan di atas / *Balance the equation*

(ii) Hitungkan bilangan mol bagi H_2O_2 yang diperlukan untuk mengurai dan menghasilkan 11.2 dm^3 gas oksigen pada STP.

[JAR: H=1, O=16, 1 mol gas menempati $22.4 \text{ dm}^3 \text{ mol}^{-1}$ pada STP] (Jwbn: 1 mol)

Calculate the number of mole for H_2O_2 is required to decomposes and produce 11.2 dm^3 oxygen gas at STP.

[RAM: H=1, O=16, 1 mole gas occupy $22.4 \text{ dm}^3 \text{ mol}^{-1}$ at STP] (Ans: 1 mol)

Info / Info	Nisbah / Ratio	Selesaikan / Solve		
Formula mol		Formula mol		
			Info	Solve
	Formula			
	From eq.			
	From calculation			
	Statement / Pernyataan	Convert to <i>Tukarkan kepada</i>		
		Solve it <i>Selesaikan</i>		

4. 8.0 g serbuk kuprum(II) oksida dicampurkan dengan asid nitrat dan dipanaskan. Hitung jisim kuprum(II) nitrat yang terhasil.

[JAR: N = 14, O = 16, Cu = 64] (Jwbn: 18.8g)

8.0 g copper(II) oxide powder was mix with nitrate acid and was heated. Calculate the mass of copper(II) nitrate had produced. [RAM for N=14, O=16, Cu=64] (Ans : 18.8g)

Persamaan :

Equation

Info / Info	Nisbah / Ratio	Selesaikan / Solve		
Formula mol		Formula mol		
			Info	Solve
	Formula			
	From eq.			
	From calculation			
	Statement / Pernyataan	Convert to <i>Tukarkan kepada</i>		
		Solve it <i>Selesaikan</i>		

Aktiviti 3: Mol dalam Persamaan Kimia II*Activity 3: Mole in Chemical Equation II*

11.7 g kalium terbakar dalam oksigen untuk menghasilkan kalium oksida.

[RAM: K=39; O=16; Isi padu Molar adalah 24 dm³ pada suhu bilik]

11.7 g of potassium was burnt in oxygen to produce potassium oxide.

[RAM: K=39; O=16; Molar Volume is 24 dm³ at room temperature]

Hitung / Calculate:

(a) Jisim kalium oksida yang dihasilkan. (Jwpn: 14.1 g)

Mass of potassium oxide being produced. (Ans: 14.1 g)

Info / Info	Nisbah / Ratio	Selesaikan / Solve												
Formula mol	<table border="1"> <tr> <td></td> <td>Info</td> <td>Solve</td> </tr> <tr> <td>Formula</td> <td></td> <td></td> </tr> <tr> <td>From eq.</td> <td></td> <td></td> </tr> <tr> <td>From calculation</td> <td></td> <td></td> </tr> </table>		Info	Solve	Formula			From eq.			From calculation			Formula mol Convert to <i>Tukarkan kepada</i> Solve it <i>Selesaikan</i>
			Info	Solve										
		Formula												
		From eq.												
From calculation														
Statement / Pernyataan														

(b) Jumlah isi padu oksigen yang bertindak balas pada suhu bilik. (Jwpn: 1.8 dm³)

Volume of oxygen reacts at room temperature. (Ans: 1.8 dm³)

Info / Info	Nisbah / Ratio	Selesaikan / Solve												
Formula mol	<table border="1"> <tr> <td></td> <td>Info</td> <td>Solve</td> </tr> <tr> <td>Formula</td> <td></td> <td></td> </tr> <tr> <td>From eq.</td> <td></td> <td></td> </tr> <tr> <td>From calculation</td> <td></td> <td></td> </tr> </table>		Info	Solve	Formula			From eq.			From calculation			Formula mol Convert to <i>Tukarkan kepada</i> Solve it <i>Selesaikan</i>
			Info	Solve										
		Formula												
		From eq.												
From calculation														
Statement / Pernyataan														

TAMAT

P/S:

SESUNGGUHNYA PERKARA YANG PALING BERAT ADALAH AMANAH. JADI SELESAIKAN AMANAH YANG SAYA BERI KEPADA KAMU DENGAN SEBAIKNYA.