

CHAPTER 3: General Chemistry

Part 1: The Structure of Atoms

Democritus, a famous Greek teacher proposed the idea of the atom. Democritus said that all matter was made of tiny, indivisible particles. Called these particles atoms.

Aristotle believed that there was no empty space, therefore atoms could not move through empty space. He also believed that matter is made of earth, fire, air and water.

Dalton Atomic Theory

- Matter is composed of extremely small particles called atoms.
- Atoms are indivisible and indestructible.
- Atoms of a given element are identical in size, mass, and chemical properties.
- Atoms of a specific element are different from those of another element.
- Different atoms combine in simple whole-number ratios to form compounds.
- In a chemical reaction, atoms are separated, combined, or rearranged.
- When an electric charge is applied, a ray of radiation travels from the cathode to the anode, called a cathode ray.
- Cathode rays are a stream of particles carrying a negative charge. The particles carrying a negative charge are known as electrons.

Robert Millikan used the oil-drop experiment to determine the charge of an electron.

Ernest Rutherford studied how positively charged alpha particles interacted with the solid matter by aiming the particles at a thin sheet of gold foil.

- Although most of the alpha particles went through the gold foil, a few of them bounced back, some at large angles
- Almost all of the atom's positive charge and almost all of its mass are contained in a dense region in the center of the atom called the nucleus
- The repulsive force between the positively charged nucleus and positive alpha particles caused the deflections.
- Positively charged particles in the nucleus called protons.
- Neutrons, neutral particles in the nucleus.

The number of protons in the nucleus is the atomic number

- The sum numbers of protons and neutrons is called the atomic mass number
- Atoms are electrically neutral because they have equal numbers of protons (positively charged) and electrons (negatively charged). If an atom gains or loses one or more electrons.
- Atoms with the same number of protons but different numbers of neutrons are called isotopes
- One atomic mass unit (amu) is defined as 1/12th the mass of a carbon-12 atom.
- One amu is nearly, but not exactly, equal to one proton and one neutron.

scientists noticed some substances spontaneously emitted radiation, a process they called radioactivity.

- The rays and particles emitted are called radiation.
- A reaction that involves a change in an atom's nucleus is called a nuclear reaction. Nuclear reactions can change one element into another element.
- Unstable nuclei lose energy by emitting radiation in a spontaneous process called radioactive decay
- There are three types of radiation: alpha, beta, and gamma
- Alpha radiation is made up of positively charged particles called alpha particles. Each alpha particle contains two protons and two neutrons and has a 2+ charge
- Beta radiation is radiation that has a negative charge and emits beta particles, each beta particle is an electron with a (1-)charge.
- During Beta decay, a neutron is converted to a proton and an electron.

Gamma rays are high-energy radiation with no mass and are neutral. They usually accompany alpha and beta radiation.

Q1 First to propose the idea of atoms...

- CH A Aristotle B Democritus
3 C Dalton D Bohr

Democritus said that all matter was made of tiny, indivisible particles • Called these particles atoms. →B

Q2 Believed that all matter is continuous and composed of varying amounts of air, earth, fire and water

- CH A Aristotle B Democritus
3 C Dalton D Bohr

Aristotle believed that matter is made of earth, fire, air and water. →A

Q3 from Dalton's atomic theory: matter is composed of

- CH A Electrons B Protons
3 C Neutrons D Atoms

John Dalton revived the idea of the atom in the early 1800s based on numerous chemical reactions. →D

Q4 The smallest particle of an element that retains the properties of the element ...

- CH A Electrons B Protons
3 C Neutrons D Atoms

The smallest particle of an element that Retaining the properties of the element is called an atom. →D

Q5 Negatively charged particles that orbit the nucleus...

- CH A Electrons B Protons
3 C Neutrons D photon

The particles carrying a negative charge are known as electrons. →A

Q6 Cathode ray was a stream of ...

- CH A Positive charge
3 B Negative charge
C Photons
D Neutral particles

Cathode rays are a stream of particles carrying a negative charge. →B

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25 If alpha (α) decay happens to a nucleus then...

- CH A Mass number increase
 3 B Neither mass nor atomic number changes
 C Atomic number decrease
 D Atomic Number increases but mass number decreases
 If alpha (α) decay happens to a nucleus then Atomic number decrease \rightarrow C

26 Which of the following radiations is not affected by the electric field?

- CH A Alpha B Beta
 3 C Gamma D Cathode ray
 Gamma rays are high-energy radiation with no mass and are neutral \rightarrow C

27 If beta (β) radiation is emitted from an atom, then the mass number of the atom...

- CH A Decreases by 2 B Increases by 1
 3 C Decreases by 4 D Does not change
 Beta radiation is radiation that has a negative charge and emits beta particles, each beta particle is an electron with a 1- charge. \rightarrow B

28 If alpha particle decay happens to an element's nucleus then mass number A and atomic Number Z becomes...

- CH A A+4, Z+2
 3 B A+4, Z-2
 C A-4, Z+2
 D A-4, Z-2
 If alpha (α) decay happens to a nucleus then Atomic number and mass number decrease \rightarrow D

29 If a ... radiation is emitted from an atom, then its atomic number decreases by 2 ...

- CH A Alpha B Positive Beta
 3 C Gamma D Negative Beta
 Each alpha particle contains two protons and two neutrons and has a (2+) charge \rightarrow A

30 Radiation accounts for most of the energy lost during a radioactive decay

- CH A Alpha B Gamma
 3 C Negative Beta D Positive Beta
 Gamma rays are high-energy radiation with no mass and are neutral \rightarrow B

Part 2: Chemical Reactions

The process by which one or more substances are rearranged to form different substances is called a **chemical reaction**.

Evidence that a chemical reaction may have occurred: - Change in temperature

- Change in color - Odor - Gas bubbles - Appearance of a solid

Chemists use statements called **equations** to represent chemical reactions.

Reactants are the starting substances.

Products are the substances formed in the reaction. A **chemical equation** is a statement that uses chemical formulas to show the identities and relative amounts of the substances involved in a chemical reaction.

Types of Chemical Reactions:

- **Synthesis reaction (Combination):** $A + B \rightarrow AB$

Reaction in which two or more substances react to produce a single product.

- **Decomposition reaction:** $AB \rightarrow A + B$

One in which a single compound breaks down into two or more elements or new compounds.

Combustion reaction: Oxygen combines with a substance and releases energy in the form of heat and light.

Ex: - $4Na + O_2 \rightarrow 2Na_2O$ - $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

- **Single replacement reaction:** $A + BX \rightarrow AX + B$

A reaction in which the atoms of one element replace the atoms of another element in a compound.

Metal will not always replace metal in a compound dissolved in water because of differing reactivities.

An activity series can be used to predict if reactions will occur.

Double replacement reactions $AY + BX \rightarrow AX + BY$

occur when ions exchange between two compounds. All double replacement reactions produce either liquid water, liquid, precipitate, or a gas.

Most Active	↓	Metals Lithium Li Rubidium Ru Potassium K Calcium Ca Sodium Na Magnesium Mg Aluminium Al Zinc Zn Iron Fe Nickel Ni Tin Sn Lead Pb Copper Cu Silver Ag Platinum Pt Gold Au
Least active	↓	Halogens Fluorine F Chlorine Cl Bromine Br Iodine I
Most active	↓	
Least active	↓	

Q31 Rearranging the atoms of two or more elements to form different substances is called...

- CH A A chemical reaction
 3 B A chemical equation
 C Chemical equilibrium
 D Rate of chemical reaction
 The process by which one or more substances are Rearranged to form different substances is called a chemical reaction. \rightarrow A

Q33 Reaction with a single reactant is...

- CH A Decomposition B Replacement
 3 C Combustion D synthesis
 Decomposition reaction: One in which a single compound breaks down into two or more elements or new compounds. \rightarrow A

Q32 In combustion: a substance reacts with...

- CH A Hydrogen B Oxygen C Chlorine D Nitrogen
 3 Oxygen combines with a substance and releases energy in the form of heat and light. \rightarrow B

Q34 The type of reaction that produces one product is...

- CH A Decomposition B Replacement
 3 C Combustion D Synthesis
 Synthesis reaction (Combination): Reaction in which two or more substances react to produce a single product. \rightarrow D \rightarrow

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Q35 The type of reaction $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$ is ...

- CH A Decomposition B Replacement
3 C Combustion D Synthesis

Synthesis reaction (Combination): Reaction in which two or more substances react to produce a single product.

→D

Q36 Which of the following reaction a decomposition reaction

- CH A $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
3 B $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
C $\text{Cd}(\text{NO}_3)_2 + \text{H}_2\text{S} \rightarrow \text{CdS} + 2\text{HNO}_3$
D $\text{C}_2\text{H}_6 + \text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2$

Decomposition reaction: One in which a single compound breaks down into two or more elements or new compounds.

→B

Q37 Which of the following reaction a decomposition reaction

- CH A $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
3 B $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$
C $\text{NaHCO}_3 \rightarrow \text{NaOH} + \text{H}_2\text{O} + \text{CO}_2$
D $\text{C}_4\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

Decomposition reaction: One in which a single compound breaks down into two or more elements or new compounds.

→C

Q38 Which of the following reaction is a single replacement reaction

- CH A $2\text{Fe} + 3\text{Br}_2 \rightarrow 2\text{FeBr}_3$
3 B $\text{K}(s) + \text{NaCl}(aq) \rightarrow \text{KCl}(aq) + \text{Na}(s)$
C $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
D $\text{NaCl}(aq) + \text{AgNO}_3(aq) \rightarrow \text{NaNO}_3(aq) + \text{AgCl}(s)$

A reaction in which the atoms of one element replace the atoms of another element in a compound.

→B

Q39 Which of the following reaction is a double replacement reaction

- CH A $\text{C}_6\text{H}_{12} + 9\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$
3 B $\text{O}_3 \rightarrow \text{O} + \text{O}_2$
C $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
D $\text{Na}_3\text{PO}_4(aq) + 3(\text{KOH})_3(aq) \rightarrow \text{NaOH}(aq) + \text{K}_3\text{PO}_4(s)$

A reaction in which the atoms of one element replace the atoms of another element in a compound.

→D

Q40 Which of the following reaction is a combustion reaction?

- CH A $\text{C}_6\text{H}_{12} + 9\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$
3 B $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
C $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
D $\text{Na}_3\text{PO}_4(aq) + 3(\text{KOH})_3(aq) \rightarrow \text{NaOH}(aq) + \text{K}_3\text{PO}_4(s)$

Combustion reaction: Oxygen combines with a substance

→A

Q41 The separation of the components of sodium chloride (NaCl) is ...

- CH A Decomposition B Replacement
3 C Combustion D Synthesis

Decomposition reaction: One in which a single compound breaks down into two or more elements or new compounds.

→A

Q42 The type of reaction

$\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ is ...

- CH A Decomposition B Replacement
3 C Combustion D Synthesis

Decomposition reaction: One in which a single compound breaks down into two or more elements or new compounds.

→A

Q43 Which of the following reactions can occur?

- CH A $\text{Na} + \text{KCl} \rightarrow$
3 B $\text{K} + \text{NaCl} \rightarrow$
C $\text{Br}_2 + \text{NaCl} \rightarrow$
D $\text{I}_2 + \text{NaCl} \rightarrow$

An activity series can be used to predict if reactions will occur.

→B

Q44 Which of the following reactions cannot occur?

- CH A $\text{Li} + \text{KCl} \rightarrow$
3 B $\text{K} + \text{NaCl} \rightarrow$
C $\text{Na} + \text{CaCl}_2 \rightarrow$
D $\text{Li} + \text{NaCl} \rightarrow$

An activity series can be used to predict if reactions will occur.

→C

Q45 Which of the following reactions represent combustion and synthesis reactions at the same time?

- CH A $2\text{Fe} + 3\text{Br}_2 \rightarrow 2\text{FeBr}_3$
3 B $2\text{Ca} + \text{O}_2 \rightarrow 2\text{CaO}$
C $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
D $\text{Li} + \text{NaCl} \rightarrow \text{LiCl} + \text{Na}$

Synthesis reaction (Combination): Reaction in which two or more substances react to produce a single product.

Combustion reaction: Oxygen combines with a substance

→B

Q46 Predict the results of the following reaction
 $\text{Na} + \text{AlCl}_3 \rightarrow$

- CH A $\text{NaCl} + \text{AlCl}_2$
3 B $\text{NaCl}_2 + \text{Al}$
C $3\text{NaCl} + \text{Al}$
D $\text{NaCl}_3 + \text{Al}$

An activity series can be used to predict if reactions will occur.

→C

Q47 Which of the following reaction is a double replacement reaction

- CH A $\text{Ca} + \text{O}_2 \rightarrow \text{CaO}$
3 B $\text{O} + \text{O}_2 \rightarrow \text{O}_3$
C $\text{CaO} + \text{CO}_2 \rightarrow \text{CaCO}_3$
D $\text{NaOH}_{(aq)} + \text{HCl}_{(aq)} \rightarrow \text{NaCl}_{(aq)} + \text{H}_2\text{O}_{(l)}$

A reaction in which the atoms of one Element replace the atoms of another element in a compound.

→D

1 The reaction $\text{H}_2\text{CO}_3 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ is

- Do A Combination B Decomposition
It? C Combustion D Replacement

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Part 3: The Mole

The **mole** is an SI base unit used to measure the amount of a substance. **Avogadro's number** is $N_A = 6.02 \times 10^{23}$

The molar mass of a compound tells you the mass of 1 mole of that substance.

To find the molar mass of a compound:

1. Use the chemical formula to determine the number of each type of atom present in the compound.
2. Multiply the atomic weight (from the periodic table) of each element by the number of atoms of that element present in the compound.
3. Add it all together and put units of grams/mole after the number.



48 How many atoms are there in 2 mol of Lithium (Li)?

($N_A = 6.02 \times 10^{23}$)

- CH** A 2×10^{23} B 6.02×10^{23}
3 C 12.04×10^{23} D 6.02×10^{-23}

$$\text{Number of atoms} = \text{number of moles} \times N_A$$

$$\text{Number of atoms} = 2 \times 10^{23} \text{ atom} \rightarrow \text{C}$$

49 How many moles are there in 12.04×10^{23} atom of Lithium (Li)?

- CH** A 1 mol B 2 mol
3 C 3 mol D 4 mol

$$\text{Number of mols} = \frac{\text{number of atoms}}{N_A}$$

$$= \frac{12.04 \times 10^{23} \text{ atom}}{6.02 \times 10^{23}} \\ = 2 \text{ mol} \rightarrow \text{B}$$

50 How many moles are there in 21 g of Lithium (Li)? (Molar mass of Li = 7 g/mol)

- CH** A 1 mol B 2 mol
3 C 3 mol D 4 mol

$$\text{Number of moles} = \frac{\text{Mass in grams}}{\text{Molar mass}} \\ = \frac{21 \text{ g}}{7 \text{ g/mol}} = 3 \text{ mol} \rightarrow \text{C}$$

51 How many grams are there in 5 mol of Sodium (Na)? (Molar mass of Na = 23 g/mol)

- CH** A 15 g B 215 g
3 C 23 g D 115 g

$$\text{Mass in grams} = \text{Number of moles} \times \text{Molar mass} \\ = 5 \text{ mol} \times 23 \text{ g/mol} \\ = 115 \text{ g} \rightarrow \text{D}$$

52 How many atoms are there in 14 g of Lithium (Li)?

- CH** A 2×10^{23} B 6.02×10^{23}
3 C 12.04×10^{23} D 6.02×10^{-23}

$$\text{Number of moles} = \frac{\text{Mass}}{\text{Molar mass}}$$

$$= \frac{14 \text{ g}}{7 \text{ g/mol}}$$

$$= 2 \text{ mol}$$

$$\text{Number of atoms} = \text{number of moles} \times N_A$$

$$\text{Number of atoms} = 2 \times 6 \times 10^{23} \\ = 12 \times 10^{23} \text{ atom} \rightarrow \text{C}$$

53 How many grams are there in 24.08×10^{23} of Silver (Ag)?

(Molar mass of Ag = 108 g/mol)

- CH** A 108 g B 216 g
3 C 432 g D 648 g

$$\text{Number of moles} = \frac{\text{number of atoms}}{N_A}$$

$$= \frac{24.08 \times 10^{23}}{6.02 \times 10^{23}}$$

$$= 4 \text{ mol}$$

$$\text{Mass in gram} = \text{number of moles} \times \text{Molar mass} \\ = 4 \text{ mol} \times 108 \text{ g/mol} \\ = 432 \text{ g} \rightarrow \text{C}$$

54 What is the molar mass of NaHCO_3 (Molar mass of Na = 23, H = 1, C = 12, O = 16 g/mol)

- CH** A 42 g/mol B 52 g/mol
3 C 84 g/mol D 164 g/mol

$$\text{Molar mass} = \text{the sum of molar mass for all elements in the compounds} \\ (1 \times 23) + (1 \times 1) + (1 \times 12) + (3 \times 16) = 84 \text{ g/mol} \rightarrow \text{C}$$

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55 How many molecules in 360g of $C_6H_{12}O_6$
(Molar mass of H = 1, C = 12, O = 16 g/mol)
 $N_A = 6.02 \times 10^{23}$

- CH** A 2×10^{23} B 24.08×10^{23}
3 C 12.04×10^{23} D 8.06×10^{23}

$$\begin{aligned} \text{Number of moles} &= \frac{\text{Mass}}{\text{Molar mass}} \\ &= \frac{360 \text{ g}}{180 \text{ g/mol}} \\ &= 2 \text{ mol} \end{aligned}$$

$$\text{Number of Molecules} = \text{number of moles} \times N_A$$

$$\begin{aligned} \text{Number of Molecules} &= 2 \times 6.02 \times 10^{23} \\ &= 12.04 \times 10^{23} \text{ Molecule} \quad \rightarrow \text{C} \end{aligned}$$

56 How many grams are there in
Molecules of $24.08 \times 10^{23} H_2O$?
(Molar mass of H = 1, O = 16 g/mol)
 $N_A = 6.02 \times 10^{23}$

- CH** A 144 g B 216 g
3 C 72 g D 18 g

$$\begin{aligned} \text{Number of moles} &= \frac{\text{number of molecules}}{N_A} \\ &= \frac{24.08 \times 10^{23}}{6.02 \times 10^{23}} \\ &= 4 \text{ mol} \end{aligned}$$

$$\begin{aligned} \text{Mass in gram} &= \text{number of moles} \times \text{Molar mass} \\ &= 4 \text{ mol} \times 18 \text{ g/mol} \\ &= 72 \text{ g} \quad \rightarrow \text{C} \end{aligned}$$

57 How many moles of oxygen (O) in 2 moles of
Carbonic acid H_2CO_3

- CH** A 1 mol B 2 mol
3 C 3 mol D 6 mol
Mole ratio between H_2CO_3 and O is 1:3 \rightarrow D

58 How many moles of carbon (C) in 88 grams of
propane C_3H_8

- CH** A 1 mol B 2 mol
3 C 3 mol D 6 mol
Mole ratio between C_3H_8 and C is 1:3 \rightarrow D

2 How many grams of mercury Hg in 3 mole of
mercury (Molar mass of Hg = 200 g/mol)

- Do** A 200 g B 300 g
It? C 600 g D 1200 g

3 How many moles of lead Pb in 414g of lead (Molar
mass of Pb = 207 g/mol)

- Do** A 1 mol B 2 mol
It? C 3 mol D 4 mol

4 How many molecules in 5 moles of ammonia NH_3
(Molar mass of H = 1, N = 14 g/mol)
 $N_A = 6.02 \times 10^{23}$

- Do** A 6.02×10^{23}
It? B 12.04×10^{23}
C 30.1×10^{23}
D 60.2×10^{23}

5 How many moles in 6.02×10^{22} molecules of
ammonia NH_3 ?
(Molar mass of H = 1, N = 14 g/mol)
 $N_A = 6.02 \times 10^{23}$

- Do** A 1 mol
It? B 0.1 mol
C 2 mol
D 0.2 mol

6 What is the molar mass of H_3PO_4 phosphoric
Acid.
(Molar mass of H = 1, P = 31, O = 16 g/mol)

- Do** A 310 g/mol
It? B 98 g/mol
C 196 g/mol
D 49 g/mol

7 How many moles of lithium hydroxide LiOH in
72 g of LiOH?
(Molar mass of H = 1, Li = 7, O = 16 g/mol)

- Do** A 1 mol
It? B 2 mol
C 3 mol
D 4 mol

8 How many molecules in 90g of ethanoic acid
 CH_3COOH

(Molar mass of H = 1, C = 12, O = 16 g/mol)
 $N_A = 6.02 \times 10^{23}$

- Do** A 2×10^{23} B 9.03×10^{23}
It? C 12.04×10^{23} D 18.06×10^{23}

9 How many grams of carbon dioxide CO_2 in
 12.04×10^{22} molecules of CO_2 ?

(Molar mass of H = 1, Li = 7, O = 16 g/mol)
 $N_A = 6.02 \times 10^{23}$

- Do** A 44g
It? B 4.4g
C 88g
D 8.8g

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Part 4: Stoichiometry

What is Stoichiometry?

Stoichiometry is the study of quantitative relationships between the amounts of reactants used and the amounts of products formed by a chemical reaction.

Stoichiometry is based on the law of conservation of mass. (*The mass of reactants equals the mass of the products*)

- Stoichiometry is based on the chemical equation and mole ratios between reactants and products

Steps for balancing equations

-Count the atoms of the elements in the reactants. If a reaction involves identical polyatomic ions in the reactants and products, count the ions as if they are elements

-Count the atoms of the elements in the products

Change the coefficients to make the number of atoms of each element equal on both sides of the equation. Never change a subscript in a chemical formula to balance an equation because doing so changes the identity of the substance.

- Write the coefficients in their lowest possible ratio. The coefficients should be the smallest possible whole numbers.

Limiting Reactants

• Reactions proceed until one of the reactants is used up and one is left in excess.

• The limiting reactant limits the extent of the reaction and, thereby, determines the amount of product formed.

• The excess reactants are all the leftover unused reactants.

Percent Yield

• Laboratory reactions do not always produce the calculated amount of products.

• Reactants stick to containers.

• Competing reactions form other products.

• The *theoretical yield* is the maximum amount of product that can be produced from a given amount of reactant.

• The *actual yield* is the amount of product actually produced when the chemical reaction is carried out in an experiment.

• The percent yield of a product is the ratio of the actual yield expressed as a percent.

$$\text{Percent Yield} = \frac{\text{Actual yield}}{\text{Theoretical yield}} \times 100\%$$

• Percent yield is important in the cost-effectiveness of many industrial manufacturing processes

59 The mole ratios can be determined only if what?

- CH A All the reactants are present in unequal amounts
3 B The reactants do not have coefficients
C The products do not have coefficients
D The equation is balanced

Mole ratio depends on balanced chemical equation →D

60 The coefficient x in the balanced chemical equation $\text{N}_2 + x\text{H}_2 \rightarrow 2\text{NH}_3$ is ...

- CH A 3 B 6
3 C 2 D 12



61 Which of the following is the correct mole ratio for the following equation? $\text{Al(s)} + \text{Br}_2(\text{l}) \rightarrow \text{AlBr}_3(\text{s})$

- CH A 2 mol Al : 3 mol Br
3 B 3 mol Br₂ : 2 mol Al
C 2 mol AlBr₃ : 1 mol Br₂
D 2 mol Br : 2 mol Al

Balanced chemical equation is



63 Mass of reactants and mass of products in a chemical reaction...

- CH A Are not equal
3 B Are increased equally
C Are equal
D are unrelated

The law of conservation of mass. (The mass of reactants equals the mass of the products) →C

62 How many moles of CO₂ will be produced in the following reaction if the initial amount of CH₄ were 2 moles? $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$

- CH A 3 B 4 C 2 D 1

3 The mole ratio between CH₄ and CO₂ is 1:1 →C

64 The amount of product that can be produced from a given amount of reactants based on stoichiometric calculations is:

- CH A Actual yield
3 B Percent yield
C Theoretical yield
D Stoichiometric yield

The theoretical yield is the maximum amount of product that can be produced from a given amount of reactant. →C

65 The mass of the final product in a chemical reaction is based on what?

- CH A The amount of excess reactant
3 B The amount of limiting reactant
C The presence of a catalyst
D The amount of O₂ present

The amount of limiting reactant →B

10 How many moles of CO₂ will be produced when 4 moles of C₄H₁₀ reacted with enough amount of oxygen.



- Do A 2 B 4
It? C 8 D 16

Chapter 3: Do It Answer key

1	2	3	4	5	6	7	8	9	10
B	C	B	C	B	B	C	B	D	D