Ali Series
2020 Edition

CHEMISTRY
IN MY POCKET
WITH VIDEO SOLUTION

Ali Sudais PHD, INORGANIC COMPUTATIONAL CHEMISTRY

Concepts
Tricks and Shortcuts
Mnemonics
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Quality Illustrations
Past paper MCQs
Exercies MCQs
Clearance of Doubtful Points
Lists

ACA-ALI COACHING ACADEMY
ONLINE AND PHYSICAL

Unit 1: Stoichiometry

ETEA concepts and types of MCQs

ACA Abbottabad

Matter
Occupies space and possesses mass; may exist as solid, liquid, or gas

Pure substance
Matter having an invariant chemical composition and distinct properties

Element
Fundamental substance; cannot be separated into simpler substances by chemical methods

Compound
Substance composed of two or more elements in fixed proportions; can be separated into simpler substances and elements only by chemical methods*

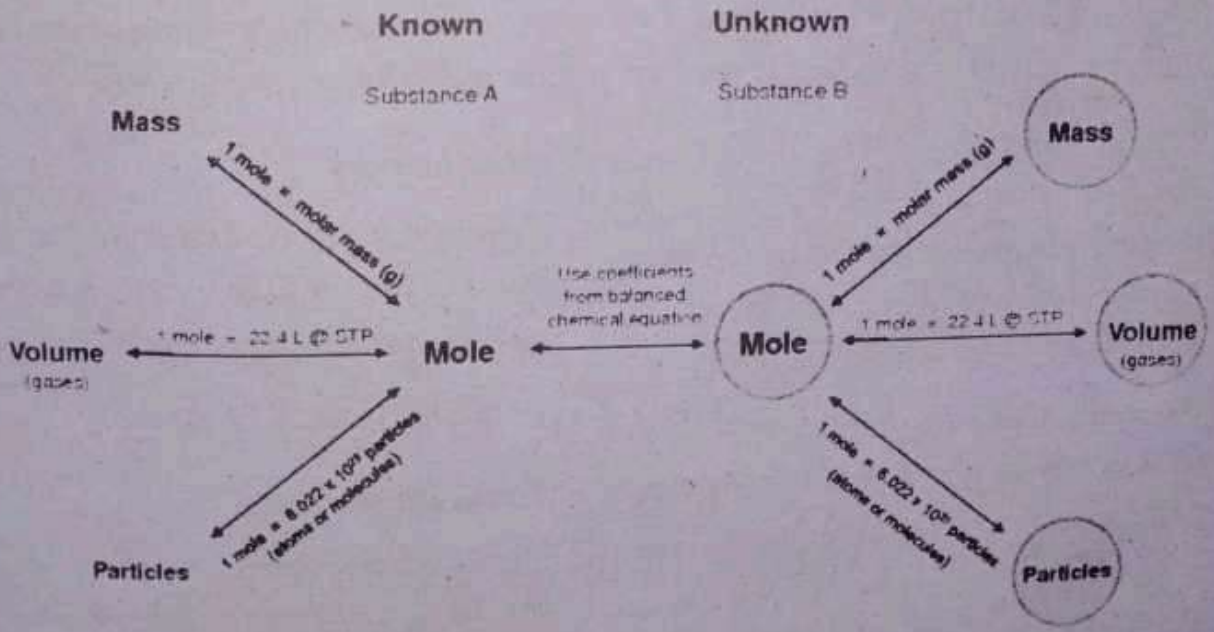
Mixture
Matter consisting of two or more pure substances that retain their individual identities and can be separated by physical methods†

Homogeneous
Mixture having a uniform composition and properties throughout (also called a solution)

Heterogeneous
Mixture not uniform in composition and properties throughout

*Chemical methods of separation include electrolysis

†Physical methods of separation include filtration, distillation, and crystallization



BASIC CONCEPTS

Important definitions of the book

Chemistry

The study of matter and the changes it undergoes.
Chemistry is a central science.

Matter

Anything that occupies space and has mass is called matter.

Substance

A substance is matter which has a specific composition and specific properties.
Every pure element is a substance. Every pure compound is a substance.

Element

A substance that can't be separated by chemical means."

Element consists of one type of particles i.e. atoms or molecules. He, H_2, S_8 and Na, etc. are all element.

Atom

"The smallest particle of an element which may or may not exist independently is called an atom."

This is the basic unit of an element that can enter into a chemical combination. It doesn't lose its identity in a chemical reaction.

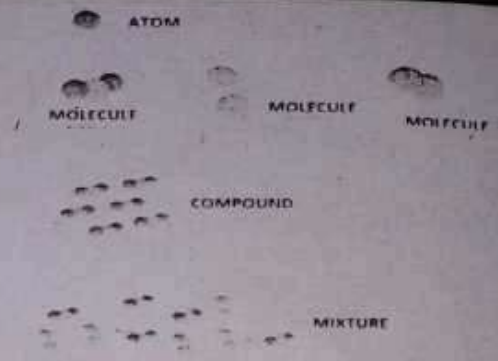
Molecule

"The smallest particle of an element or compound which can exist independently is called molecule."
The combination/aggregation of at least two atoms in a definite arrangement held together by chemical force. Atoms can be same or different in a molecule.

Compound

When two or more than two elements combine together in a fixed ratio by mass is called a compound.

A compound is made of two or more different elements or atoms i.e. H_2O.



Ion

"A species having a positive or negative charge is called an ion."

Stoichiometry

The quantitative chemistry that deals with the calculations involved in the interconversion of matter during any chemical change.

Relative atomic mass

"The mass of one atom of an element compared with the mass of an atom of carbon taken as 12 is called relative atomic mass."

Atomic mass

"Atomic mass is also called atomic weight. The mass of the atom in atomic mass unit. The atomic mass unit is a mass which is exactly equal to $\frac{1}{12}$ of the mass of C-12 atom."

Gram atom

"The atomic mass of an element expressed in grams is called gram atom. It is also known as gram mole or simply mole."

Gram Formula

When the formula mass is expressed in grams, is called gram formula. It is also called as mole or gram formula mass.
Formula mass is the mass of an ionic compound such as NaCl and its mass in gram is called gram formula or gram formula mass which is 58.5g. $CaCO_3$ has 100g gram formula.

Gram Ion

"The ionic mass of an ion expressed in grams is called gram ion"