

Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -02)

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IS MATTER AROUND US PURE

PURE SUBSTANCES

Elements and Compounds are considered as pure substances.

Elements – Substances that is made of only one element are called elements, such as hydrogen, carbon, oxygen, silver, gold, etc.

Elements can be normally divided into **metals, non-metals and metalloids**.

Metals usually show some or all of the following properties:

- They have lustre (shine).
- They have silvery-grey or golden-yellow colour.
- They conduct heat and electricity.
- They are ductile (can be drawn into wires).
- They are malleable (can be hammered into thin sheets).
- They are sonorous (make a ringing sound when hit).

Examples of metals are gold, silver, copper, iron, sodium, potassium etc.

Mercury is the only metal that is liquid at room temperature.

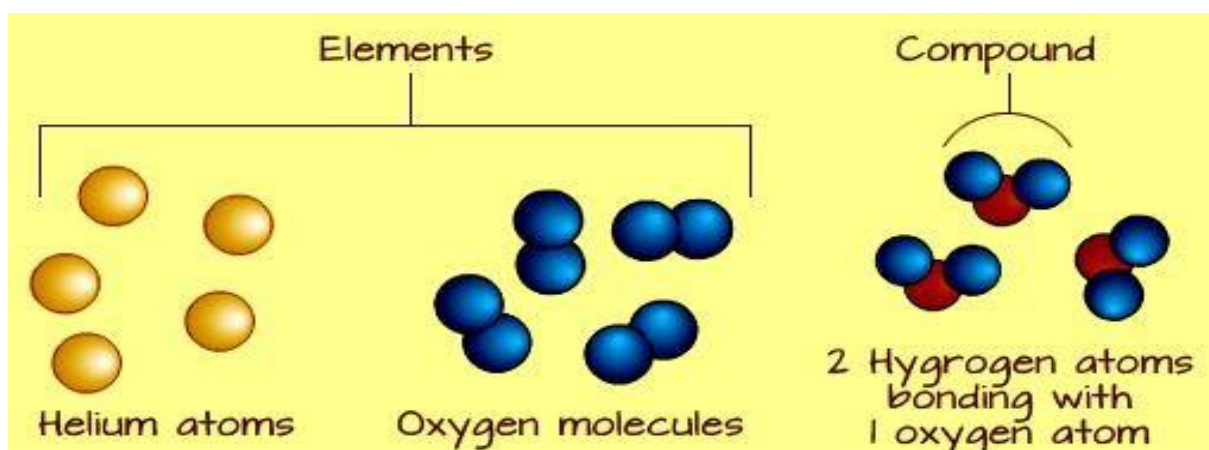
Non-metals usually show some or all of the following properties:

- They display a variety of colours.
- They are poor conductors of heat and electricity.
- They are not lustrous, sonorous or malleable.

Examples of non-metals are hydrogen, oxygen, iodine, carbon (coal, coke), bromine, chlorine etc. Some elements have intermediate properties between those of metals and non-metals, they are called metalloids; examples are boron, silicon, germanium etc.

Compounds – Substances that is made of one or more elements by chemical combination are called compounds, such as water, carbon dioxide, copper oxide, hydrochloric acid, etc.

A compound does not contain the properties of its constituent elements and shows quite different characteristics.



COMPARISON BETWEEN COMPOUND AND ELEMENT

	Compound	Element
Distinguishing Feature	Compounds contain different elements in a fixed ratio arranged in a defined manner through chemical bonds.	Elements are distinguished by their atomic number (number of protons in their nucleus).
Ability to Breakdown	A compound can be separated into simpler substances by chemical methods/reactions.	Elements cannot be broken down into simpler substances by chemical reactions.
Types	The list of compounds is endless.	There are about 117 elements that have been observed. Can be classified as metal, non-metal or metalloid.
Representation	A compound is represented using a formula.	An element is represented using symbols.
Examples	Water (H ₂ O), Sodium chloride (NaCl), Sodium bicarbonate (NaHCO ₃) etc.	Iron, copper, silver, gold, nickel etc.

COMPARISON BETWEEN MIXTURE AND COMPOUND

Mixture	Compound
Elements are physically mixed in any ratio and no new compound is formed.	Elements are chemically combined in a fixed ratio to form a new compound.
They have no sharp or definite melting point, boiling point, density etc.	They have definite melting point, boiling point, density etc.
A mixture exhibits the properties of its constituent or component elements.	Property of a compound is different from its constituent or component elements.
They are either homogeneous or heterogeneous in nature.	They are always homogeneous in nature.
Constituents of a mixture can be separated by physical methods like filtration, magnetic separation etc.	Constituents of a compound cannot be separated by physical methods.

INTEXT QUESTIONS PAGE NO. 24

Q1. Classify the following as chemical or physical changes:

- cutting of trees,
- melting of butter in a pan,
- rusting of almirah,
- boiling of water to form steam,
- passing of electric current, through water and the water breaking down into hydrogen and oxygen gases,
- dissolving common salt in water,
- making a fruit salad with raw fruits, and
- burning of paper and wood.

Answer:

- Cutting of trees → Physical change
- Melting of butter in a pan → Chemical change
- Rusting of almirah → Chemical change
- Boiling of water to form steam → Physical change
- Passing of electric current through water, and water breaking down into hydrogen and oxygen gas → Chemical change
- Dissolving common salt in water → Physical change
- Making a fruit salad with raw fruits → Physical change
- Burning of paper and wood → Chemical change

Q2. Try segregating the things around you as pure substances or mixtures.

Answer: Pure substance: Water, salt, sugar

Mixture: Salt water, soil, wood, air, cold drink, rubber, sponge, fog, milk, butter, clothes, food

IMPORTANT CONCEPT MAPS

