



INDIAN SCHOOL AL WADI AL KABIR



CLASS: VIII	DEPARTMENT: SCIENCE 2025 - 2026	DATE: 13/11/2025
TEXTBOOK Q & A	TOPIC: NATURE OF MATTER: ELEMENTS, COMPOUNDS, AND MIXTURES	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

1.

Consider the following reaction, where two substances, A and B, combine to form a product C:



Assume that A and B cannot be broken down into simpler substances by chemical reactions. Based on this information, which of the following statements is correct?

- (i) A, B, and C are all compounds, and only C has a fixed composition.
- (ii) C is a compound, and A and B have a fixed composition.
- (iii) A and B are compounds, and C has a fixed composition.
- (iv) A and B are elements, C is a compound, and has a fixed composition.

[Answer:

(iv) A and B are elements, C is a compound, and has a fixed composition.

Elements are substances that cannot be further broken down into simpler substances.

Compounds are formed when different elements combine in fixed ratios to form something entirely new.]

2. Assertion: Air is a mixture.

Reason: A mixture is formed when two or more substances are mixed, without undergoing any chemical change.

(i) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

(ii) Both Assertion and Reason are true, but Reason is not the correct explanation for Assertion.

(iii) Assertion is true, but Reason is false.

(iv) Assertion is false, but Reason is true.

Answer:

(i) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

3. Water, a compound, has different properties compared to those of the elements oxygen and hydrogen from which it is formed. Justify this statement.

Answer:

Water has different properties from hydrogen and oxygen because the chemical combination changes the nature of the elements to form a new substance. The properties of water are very different from the properties of its constituent elements: Hydrogen is a fuel, flammable gas, and oxygen supports combustion. Water, however, is a liquid at room temperature and extinguishes fire.

4. In which of the following cases are all the examples correctly matched? Give reasons in support of your answers.

(i) Elements – water, nitrogen, iron, air.

(ii) Uniform mixtures – minerals, seawater, bronze, air.

(iii) Pure substances – carbon dioxide, iron, oxygen, sugar.

(iv) Non-uniform mixtures – air, sand, brass, muddy water.

Answer:

iii) Pure substances – Carbon dioxide, iron, oxygen, and sugar are all pure substances. A pure substance is composed of only one type of particle. Carbon dioxide and sugar are compounds, while iron and oxygen are elements.

5. Iron reacts with moist air to form iron oxide, and magnesium burns in oxygen to form magnesium oxide. Classify all the substances involved in the above reactions as elements, compounds, or mixtures, with justification.

Answer:

Iron → element, Moist air → mixture, Iron oxide → compound

Magnesium → element, Oxygen → molecule of element, Magnesium oxide (MgO) → compound

Elements are substances that cannot be further broken down into simpler substances.

Compounds are formed when different elements combine in fixed ratios to form something entirely new.

When two or more substances are mixed, where each substance retains its properties, it is called a mixture.]

6. Classify the following as elements, compounds, or mixtures in Table 8.3. Carbon dioxide, sand, seawater, magnesium oxide, muddy water, aluminium, gold, oxygen, rust, iron sulfide, glucose, air, water, fruit juice, nitrogen, sodium chloride, sulfur, hydrogen, and baking soda. Identify pure substances amongst these and list them below.

Answer: Table 8.3.

Elements,	Compounds	Mixtures
aluminium, gold, oxygen, nitrogen, sulfur, hydrogen	Carbon dioxide, magnesium oxide, rust, iron sulfide, glucose, water, sodium chloride, baking soda.	sand, seawater, air, fruit juice muddy water

Pure substances: Carbon dioxide, magnesium oxide, iron sulfide, glucose, water, sodium chloride, rust, baking soda, aluminium, gold, oxygen, nitrogen, sulfur, hydrogen.
(Pure substances include all elements and compounds.)

7. What new substance is formed when a mixture of iron filings and sulfur powder is heated, and how is it different from the original mixture? Also, write the word equation for the reaction.

Answer:

When iron filings and sulfur powder are heated, they react to form a new substance known as iron sulfide. This is a chemical change, and the resulting compound has different properties from the original iron and sulfur.

The word equation for the reaction is: $\text{Iron} + \text{Sulfur} \rightarrow \text{Iron Sulfide}$.

Original Mixture

Iron filings and sulfur powder are physically mixed. They retain their individual properties, and the mixture can be separated by physical means, such as using a magnet to attract the iron.

Heating the mixture causes a chemical reaction.

Iron sulfide has its unique properties that are distinct from those of iron and sulfur. For example, it is a black solid, whereas iron is typically grey, and sulfur is yellow. It is also not attracted to magnets like iron.

8. Is it possible for a substance to be classified as both an element and a compound? Explain why or why not.

Answer:

No, a substance cannot be classified as both an element and a compound.

Elements are pure substances that cannot be broken down into simpler substances by chemical means, while compounds are formed when two or more different elements are chemically bonded together. Therefore, a substance cannot be both a single type of atom and a combination of different kinds of atoms simultaneously.

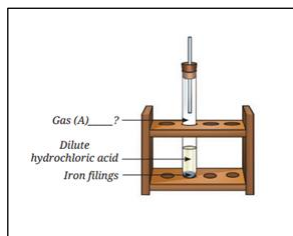
9. How would our daily lives be changed if water were not a compound but a mixture of hydrogen and oxygen?

Answer:

If water were a mixture of hydrogen and oxygen, it would not be a safe liquid but an explosive mixture of gases. Life could not exist, as there would be no real water for drinking, agriculture, or biological processes.

- No safe drinking water \rightarrow Life would not be possible.
- No water for agriculture \rightarrow Crops would not grow.
- No water for cleaning or cooking \rightarrow Daily tasks would be unsafe.
- No aquatic life \rightarrow Fish and underwater plants would die.
- Increased fire hazards \rightarrow Hydrogen and oxygen together in a mixture are explosive.

10. Analyse the figure. Identify Gas A. Also, write the word equation of the chemical reaction.



Answer:

By analysing the figure, it is found that there will be a chemical reaction inside the test tube between dilute hydrochloric acid and iron filings.

So the reaction forms Iron Chloride, and the gas above will be Hydrogen.

Hydrochloric Acid + Iron filings \rightarrow Iron Chloride + Hydrogen

Thus, Gas A = Hydrogen

11. Write the names of any two compounds made only from non-metals, and also mention two uses of each of them.

Answer:

1. Carbon Dioxide

Made of: Carbon and Oxygen (both non-metals)

Uses:

- **Used in fire extinguishers to put out flames.**
- **Used by plants during photosynthesis to make food.**

2. Ammonia

Made of: Nitrogen and Hydrogen (both non-metals)

Uses:

- **Used in the manufacture of fertilisers.**
- **Used in cleaning products.**

12. How can gold be classified as both a mineral and a metal?

Answer:

A mineral is a naturally occurring substance with a definite chemical composition.

Gold is found in nature in its native form, often embedded in rocks. It is extracted through mining, making it a metallic mineral.

Gold as a Metal

After extraction, gold is refined and used as a metal. It is a pure element (symbol: Au) with typical metallic properties:

- **Lustrous (shiny), Malleable (can be shaped), Ductile (can be drawn into wires), Good conductor of electricity**
- **Used in jewellery, electronics, and currency.**

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