
	<b>INDIAN SCHOOL AL WADI AL KABIR</b>		
<b>CLASS: VIII</b>	<b>DEPARTMENT: SCIENCE 2025-26</b>	<b>DATE: 13/11/2025</b>	
<b>WORKSHEET NO:9 WITH ANSWERS</b>	<b>TOPIC: NATURE OF MATTER: ELEMENTS, COMPOUNDS, AND MIXTURES</b>	<b>NOTE: A4 FILE FORMAT</b>	
<b>NAME OF THE STUDENT:</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>	

### **I. OBJECTIVE-TYPE QUESTIONS:**

1. A student heated a mixture of iron filings and sulfur. The product formed was black and did not attract a magnet. What does this show?
  - (a) Sulfur lost its magnetic properties.
  - (b) A compound was formed.
  - (c) A physical change occurred.
  - (d) Iron retained its magnetic properties.
2. Which of the following can be separated by physical means?
  - (a) Water
  - (b) Carbon dioxide
  - (c) Salt solution
  - (d) Iron sulfide
3. Air is considered a mixture because:
  - (a) It is made up of many gases mixed together.
  - (b) Its components are chemically combined.
  - (c) It cannot be separated by physical means.
  - (d) It has a fixed ratio of gases.
4. Which of the following is an example of an element?
  - (a) Sugar solution
  - (b) Iron sulphide
  - (c) Gold

(d) Sea water

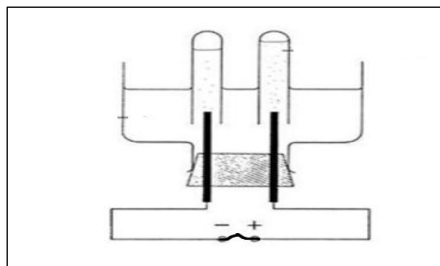
5. During electrolysis of water, hydrogen and oxygen gases are released in the ratio:

(a) 1: 1

(b) 1: 2

(c) 2: 1

(d) 3: 1



6. When lime water turns milky upon exposure to air, it indicates the presence of carbon dioxide. The milky is due to the formation of:

(a) Calcium oxide

(b) Calcium carbonate

(c) Calcium bicarbonate

(d) Calcium hydroxide

7. Which of the following statements about minerals is correct?

(a) All minerals are pure elements that can be seen only with a microscope.

(b) Native minerals are compounds made of more than one element.

(c) Most rocks are mixtures of minerals, and some minerals are pure elements called native minerals.

(d) Talcum powder is made from the mineral quartz.

*For question numbers 8-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below -*

**i) Both A and R are true, and R is the correct explanation of the assertion.**

**ii) Both A and R are true, but R is not the correct explanation of the assertion.**

**iii) A is true, but R is false.**

**iv) A is false, but R is true**

8. **Assertion (A):** Milk is a mixture of water, fat, protein, carbohydrates, and minerals.

**Reason (R):** Milk is a pure substance as it does not contain anything other than milk.

9. **Assertion (A):** Graphene aerogel can be used as an environmental cleaner.

**Reason (R):** It is highly porous and has high absorbing capacity.

10. **Assertion (A):** Sugar dissolved in water is a non-uniform mixture.

**Reason (R):** In a uniform mixture, the components are evenly distributed and cannot be distinguished.

## **II. VERY SHORT ANSWER TYPE QUESTIONS (2M):**

1. (i) What do you mean by components of a mixture?

**[Hint: The individual substances that make up a mixture are called its components.]**

(ii) Explain the term Mishraloha. Provide an example of an ancient Indian alloy and its medicinal uses.

**[Hint: Mishraloha refers to a mixture of two or more metals that has properties different from its individual constituent metals. An example is Bronze (Kamsya), used in ancient India to improve digestion and boost immunity.]**

2. (i) Name the components of (i) Brass, (ii) Bronze

**[Hint: (i) Brass: copper and zinc (ii) Bronze: copper and tin]**

(ii) How are compounds formed?

**[Hint: Compounds are formed when different elements combine in fixed ratios to form a completely new substance.]**

3. (i) Why is air considered a mixture?

**[Hint: Air is considered a mixture because it is made up of different gases physically combined, each retaining its own properties.]**

(ii) State the significance of oxygen and nitrogen present in the air.

**[Hint: Oxygen: Needed for respiration and combustion.]**

**Nitrogen: prevents rapid burning and helps in the nitrogen cycle.]**

4. How can you demonstrate that dust particles are suspended in the air using a black sheet of paper?

**[Hint: Place a clean black sheet of paper near an open window or in a garden for a few hours. Tiny dust particles settle on its surface, which can be observed directly or with a magnifying glass, showing that dust particles are suspended in the air.]**

5. (i) What is the main purpose of separating a mixture (a) in science (b) in everyday life

**[Hint: (ia) The purpose of separating a mixture is to obtain pure substances.]**

**(ib) Separation is done to obtain the component of interest, and other components are discarded.]**

(ii) Sodium (a metal) and chlorine (a gas) combine to form common salt (sodium chloride).

(a) Is sodium chloride an element or a compound?

(b) Can it be separated into sodium and chlorine by physical methods? Give a reason.

**[Hint: (ia) Sodium chloride is a compound because it is made up of particles of sodium and chlorine in a 1:1 ratio.**

**(iib) It cannot be separated into sodium and chlorine by physical methods. Only chemical methods can break it.]**

### **III. SHORT ANSWER TYPE QUESTIONS: (3M)**

1. Differentiate between a non-uniform mixture and a uniform mixture

**Ans:**

<b>Non-uniform mixture</b>	<b>Uniform mixture</b>
<b>Mixtures in which the different components can be seen with the naked eye or with the help of a magnifying glass are called non-uniform mixtures.</b>	<b>Mixtures in which the components are evenly distributed and cannot be distinguished from one another are known as uniform mixtures.</b>
<b>Spout salad, Sand and water</b>	<b>Sugar and water, Milk and water</b>

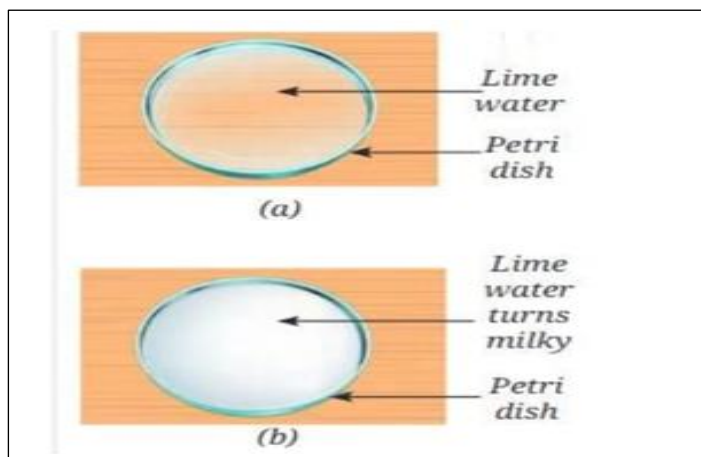
2. (i) Define Mixture

(ii) Stainless steel is also a mixture. Justify the statement.

**[ Hint: (i)When two or more substances are mixed, where each substance retains its properties, it is called a mixture.**

**(ii) Stainless steel is a mixture because it is made up of several metals, such as iron, chromium, nickel, and a small amount of carbon, that are physically combined. These components are uniformly mixed, and one cannot see the individual substances.]**

3. Observe the given figure and answer the following questions:



(i) What does the activity given above demonstrate?

**[Hint: The activity given above demonstrates the presence of carbon dioxide in the air]**

(b) Explain why lime water has turned milky.

**[Hint: When carbon dioxide reacts with lime water (calcium hydroxide), it forms calcium carbonate (insoluble tiny white particles) and water.]**

4. (i) Define pure substance

**[Hint: A pure substance is a kind of matter that cannot be separated into other kinds of matter by any physical process.]**

(ii) Why is sugar considered a pure substance in science?

**[Hint: Sugar is considered pure in science because it is made up of only one type of substance. It has a fixed composition and definite chemical and physical properties throughout. Unlike mixtures, sugar does not contain any other substance mixed with it, so it is classified as a pure substance.]**

5. When electricity is passed through water, a few gases are collected in the test tubes. Could these gases be water vapour? Explain.

**[Hint: These gases are not water vapour, because if they were, they would have condensed back into water. The gases collected are actually hydrogen and oxygen, which are produced by the electrolysis of water.]**

(ii) Explain how the understanding of elements, compounds, and mixtures is important in:

(a) Medical field and agriculture

(b) Engineering and material design

(c) Name two everyday products that are made from minerals and mention the minerals used.

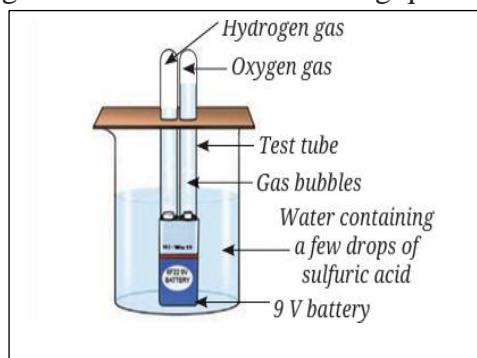
**[Hint:(a) Chemists use knowledge of elements and compounds to develop medicines and vaccines and to create fertilisers, which enhance crop production.**

**(b) Engineers and material scientists use this knowledge to design materials with special properties, such as stainless steel, and to work with building materials like wood, steel, and concrete, which are mixtures.**

**(c) Cement is made from calcite, quartz, alumina, and iron oxide, and talcum powder is made from the mineral talc.]**

#### **IV. LONG ANSWER TYPE QUESTIONS (5M):**

1. Observe the given figure and answer the following questions:



(i) Why is dilute sulfuric acid added to water during this activity?

**[Hint: To make water a better conductor of electricity]**

(ii) What can we infer about the composition of water from the activity given above?

**[Hint: From the above activity, we can infer that water is composed of two different constituents—hydrogen and oxygen.]**

(iii) Write a word equation for the activity given above.

**[Hint: Water  $\longrightarrow$  Hydrogen + Oxygen]**

(iv) Is the volume of gases collected in both the test tubes the same or different? Explain

**[Hint: No, the volume of gas collected is not the same in both test tubes. This is because water is made up of two hydrogen atoms and one oxygen atom. During electrolysis, hydrogen gas is produced in double the volume of oxygen gas, proving the 2:1 ratio of hydrogen to oxygen in water.]**

(v) In the above activity, water breaks down into hydrogen and oxygen. Is this a chemical change or a physical change? Explain.

**[Hint: This is a chemical change because water is chemically broken down into two new substances—hydrogen and oxygen. The composition and properties of the new gases are different from water.]**

2. In an experiment, a student takes 5.6 g of iron filings and 3.2 g of sulfur powder, mixes them thoroughly to form **Sample A**, and then heats a portion of it to obtain **Sample B**.

(a) Compare the physical and chemical properties of Samples A and B with respect to:

(i) Appearance and texture

(ii) Magnetic behaviour

(iii) Reaction with dilute hydrochloric acid

**[Hint: (a) Comparison of Samples A and B**

<b>Property</b>	<b>Sample A</b>	<b>Sample B</b>
<b>(i) Appearance and texture</b>	<b>Non-uniform mixture with visible black (iron) and yellow (sulfur) particles.</b>	<b>Uniform black mass with the same colour and texture throughout.</b>
<b>(ii) Magnetic behaviour</b>	<b>Iron filings attracted to the magnet show the magnetic property of iron. Sulfur is non-magnetic, so left behind.</b>	<b>Not attracted by a magnet — magnetic property lost after the chemical reaction.</b>
<b>(iii) Reaction with dilute hydrochloric acid</b>	<b>Produces a colourless, odourless gas (hydrogen) that burns with a ‘pop’ sound.</b>	<b>Produces a colourless gas with a foul, rotten-egg odour (hydrogen sulfide).</b>

(b) Explain what type of substances Samples A and B represent. Support your answer with evidence from the experiment.

- **[Hint: Sample A is a mixture of two elements -iron and sulfur.**
  - **The components can be separated by physical means (e.g., using a magnet).**
  - **Both elements retain their original properties.**
  - **Hence, no new substance is formed.**
- **Sample B is a compound, iron sulfide .**
  - **It is formed by a chemical reaction between iron and sulfur when heated.**
  - **The product has new properties different from its constituents.**
  - **The elements cannot be separated by physical means.]**

(c) Why is the gas evolved from Sample B different in smell from that evolved from Sample A? What does this difference indicate about the nature of the substances formed?

**[Hint:**

- **From Sample A, the evolved gas is hydrogen - it has no odour and burns with a pop sound.**
- **From Sample B, the evolved gas is hydrogen sulfide - it has a rotten egg-like smell and is poisonous.**
- **This difference in the gases proves that Sample B is a new substance (a compound) formed by a chemical reaction between iron and sulfur, whereas Sample A is merely a physical mixture.]**

(d) Write the chemical equations for the reactions that occur when:

(i) Iron reacts with dilute hydrochloric acid

(ii) Iron sulfide reacts with dilute hydrochloric acid

**[Hint:**

**(i) Iron + Dilute Hydrochloric acid       $\longrightarrow$       Iron chloride + Hydrogen gas**



#### **V. CASE STUDY- BASED QUESTIONS/PASSAGE-BASED QUESTIONS:**

Imagine you are a young scientist curious about the building blocks of everything around you. You learn that elements are substances that cannot be broken down into simpler substances. You also discover that many ' atoms do not exist alone—they join together to form molecules. Next, you classify elements. Some are metals, like iron, magnesium, and aluminium, which are shiny and conduct electricity. Others are non-metals, like oxygen, carbon, and sulfur, which are usually dull and poor conductors. Some elements, like silicon and boron, have properties in between metals and non-metals; these are called metalloids. Out of 118 known elements, most are solids at room temperature. Eleven are gases, such as oxygen and nitrogen. Only mercury (metal) and bromine (non-metal) are liquid. Some solids like gallium and caesium can melt near 30 °C, showing that the state of an element can change with temperature. This exploration shows how diverse and fascinating elements are, forming everything we see and touch in the world.

(i) Define elements

**[Hint: Elements are pure substances that cannot be split up into simpler substances by any usual chemical methods. They are the basic units of matter]**

(ii) How are molecules formed? Give one example

**[Hint: The atoms of most of the elements cannot exist independently. Two or more such atoms combine and form a stable particle of that element called a molecule. For example, two atoms of hydrogen combine to form one molecule of hydrogen .]**

(iii) Why are elements like silicon and boron called metalloids?

**[Hint: Elements such as silicon and boron have properties of both metals and non-metals, so they are called metalloids.]**

(iv) Name the only two elements that are liquid at room temperature. Also, mention two solid elements that melt at around 30 °C.

**[Hint: Liquid at room temperature: Mercury (metal) and Bromine (non-metal)  
Solid elements that melt around 30 °C: Gallium and Caesium.]**

#### **ANSWERS FOR THE QUESTIONS 1 TO 10**

**1. (b) A compound was formed.**

**2. (c) Salt solution**

**3. (a) It is made up of many gases mixed together.**

**4. (c) Gold**

**5. (c) 2: 1**

**6. (b) Calcium carbonate**



**7. (c) Most rocks are mixtures of minerals, and some minerals are pure elements called native minerals.**

**8. iii) A is true, but R is false.**

**9. i ) Both A and R are true, and R is the correct explanation of the assertion**

**10. iv) A is false, but R is true**

<i>Prepared by:</i> <i>Ms Suma Senu</i>	<i>Checked by:</i> <i>HOD Science</i>
--	--