

**ICSE Board**  
**Class VII Chemistry**  
**Sample Paper 3 Solution**

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**Question 1****1. (d) Gaseous**

The gaseous substances do not have their own definite shape and volume.

**2. (c) Hydrogen**

Metals react with dilute acids to liberate hydrogen gas.

**3. (b) Saturated solution**

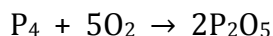
A solution which cannot dissolve more of a solute at a given temperature is called a saturated solution.

**4. (d) Non-combustible, non-supporter of combustion**

Carbon dioxide is non-combustible, non-supporter of combustion.

**5. (a) Phosphorus pentoxide**

Phosphorus burns in oxygen to form phosphorus pentoxide.

**6. (d) Double displacement**

In a double displacement reaction, two substances exchange their radicals and form a new substance.

**7. (d) Winnowing**

The winnowing method is based on the difference in weights of the solid particles.

Sieving and filtration methods are based on size and colour of the particles, and handpicking is based on the size or shape of the particles.

**8. (b) Decomposition**

Electrolysis of water is the decomposition of water ( $\text{H}_2\text{O}$ ) into oxygen ( $\text{O}_2$ ) and hydrogen ( $\text{H}_2$ ) because of an electric current being passed through the water. This is an example of a decomposition reaction.

**9. (d) All of the above**

Burning of magnesium is a permanent, irreversible and chemical change.

**10.(c)** Total mass of the products

In a chemical equation, the total mass of the reactants is equal to

**11.(c)** Salt

Sodium chloride NaCl is a salt made of  $\text{Na}^+$  and  $\text{Cl}^-$  ions.

**12.(b)**  $\text{H}_2\text{O}$

The molecular formula of water is  $\text{H}_2\text{O}$ .

**13.(b)**  $\text{SO}_2$  and  $\text{NO}_2$

The main chemicals that cause acid rain are  $\text{SO}_2$  and  $\text{NO}_2$ .

**14.(c)** Cu

Copper is a chemical element with symbol Cu, from its Latin name **cuprum**.

**15.(a)** Chemical

When iron rusts, it reacts with moisture and oxygen present in the air to form a new compound called iron oxide (rust). This is a chemical change.

**Question 2**

**(A)**

1. Caustic soda: NaOH
2. Nitric acid:  $\text{HNO}_3$
3. Lead nitrate:  $\text{Pb}(\text{NO}_3)_2$
4. Blue vitriol:  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
5. Vinegar:  $\text{CH}_3\text{COOH}$

**(B)**

1. Manganese dioxide acts as a catalyst during the formation of oxygen.
2. On burning a candle, carbon dioxide gas and water vapour are formed.
3. When ammonium chloride is dissolved in water, heat is absorbed.
4. A sublimable solid on heating turns into a gas.
5. Adding salt to water increases the boiling point of water.

**Question 3**

**(A)**

1. False. Gypsum is hydrated calcium sulphate.
2. True
3. True
4. True
5. False. False. Water freezing into ice is an example of physical change.

**(B)**

Solid 'X' to Liquid 'Y'	Melting
Liquid 'X' to its vapours 'Z'	Vaporisation
'Z' to 'X'	Solidification
'Z' to 'Y'	Condensation
The temperature at which 'Y' changes to 'Z'	Boiling point

**Question 4**

**(A)**

Element	Symbol	Valency
Oxygen	O	2
Sulphur	S	2
Bromine	Br	1
Chlorine	Cl	1
Carbon	C	4

**(B)**

1. Sodium hydroxide
2. Potassium hydroxide
3. Sodium bicarbonate
4. Calcium oxide
5. Phosphoric acid

### Question 5

(A)

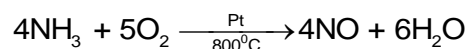
1. A chemical change is a change which is permanent and irreversible with no new substance formation. When curd is added to milk, the milk changes to curd and forms a new substance with altogether different composition and properties. This curd cannot be changed back into milk, and thus, this change is permanent and irreversible.
2. Burning of sulphur powder results in the formation of sulphur dioxide. This change is permanent and irreversible. Sulphur dioxide formed cannot be reversed into sulphur powder by altering the conditions. The composition and properties of sulphur dioxide is altogether different from those of sulphur powder. Thus, burning of sulphur powder is a chemical change.

(B)

A **catalyst** is a substance which alters (i.e. increases or decreases) the rate of the reaction without taking part in the reaction. It remains chemically unchanged at the end of the reaction.

Some reactions need a catalyst to speed up or slow down the reaction.

Example:



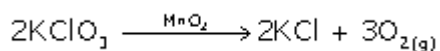
In this reaction ammonia and oxygen reacts in the presence of catalyst platinum at temperature  $800^\circ\text{C}$  to give nitric oxide and water.

#### Types of catalysts:

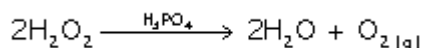
1. Positive catalyst: It is a catalyst which increases the rate of a chemical reaction.

Example:

Manganese oxide acts as a catalyst for the decomposition of potassium chlorate into potassium chloride and oxygen at a low temperature



2. Negative catalyst: It is a catalyst which decreases the rate of a reaction.



**Question 6**

**(A)**

1. Chemical equation: A chemical equation is a shorthand form representing the result of a chemical change.
2. Reactants: A substance that undergoes a chemical change during a reaction is called reactant..
3. Products: Products are substances which are formed as a result of a chemical reaction.
4. Balanced equation: A balanced equation is one in which the number of atoms of each element of the reactants is equal to the number of atoms of each element of the products.
5. Catalyst: A catalyst is a substance which speeds up a reaction but is chemically unchanged at the end of the reaction. After the reaction, the mass of the catalyst is exactly the same as that in the beginning.

**(B)**

Properties	Solids	Liquids	Gases
Shape	Definite shape	Do not have a definite shape, will take the shape of the container	No definite shape
Volume	Definite volume. As intermolecular forces between the constituent particles are strong	Definite volume. As intermolecular forces between the constituent particles are strong	No definite volume As intermolecular forces between the constituent particles are weak
Compressibility	Negligible	Negligible	High
Diffusion	Can diffuse into liquids	Diffusion is higher than solids	Highly diffusible as particles move randomly at high speed
Fluidity or rigidity	Very rigid and cannot flow from one place to another	Less rigid and are capable of flowing from higher to lower levels	No rigidity and can flow most easily among the three states of matter. They usually flow from high pressure to low pressure areas

### Question 7

1. Mixtures contain two or more different substances mixed in any proportion.

- **Heterogeneous mixture**

A mixture in which the components or constituents are not uniformly distributed throughout its volume is called a heterogeneous mixture.

- The components or the constituents can be easily seen separately.
- Example: Oil in water

- **Homogeneous mixture**

A mixture in which the components or constituents are uniformly distributed throughout its volume is called a homogeneous mixture.

- The components or the constituents cannot be easily seen separately.
- Example: Salt in water

### 2. Atomicity

The number of atoms of an element which join to form a molecule of that element is known as atomicity of that molecule. Depending on the atomicity, the molecules of elements can be termed

- *Monatomic molecules*: Monatomic molecules contain only one atom.  
Example: Zinc (Zn)
- *Diatomic molecules*: Diatomic molecules of an element contain two atoms of the same type. Example: Hydrogen molecule (H<sub>2</sub>)
- *Triatomic molecules*: Triatomic molecules of an element contain three atoms of the same type. Example: Ozone (O<sub>3</sub>)
- *Polyatomic molecules*: Polyatomic molecules of an element contain more than three atoms of the same type. Example: (P<sub>4</sub>)

3.

Elements	Compounds
<ul style="list-style-type: none"> <li>• Elements are made of one kind of atoms.</li> </ul>	<ul style="list-style-type: none"> <li>• Compounds are made of two or more kinds of atoms.</li> </ul>
<ul style="list-style-type: none"> <li>• Elements cannot be broken down into simpler substances by any physical or chemical method.</li> </ul>	<ul style="list-style-type: none"> <li>• Compounds can be broken down into simpler substances by chemical methods.</li> </ul>
<ul style="list-style-type: none"> <li>• Elements have their own set of properties.</li> </ul>	<ul style="list-style-type: none"> <li>• Properties of a compound differ from those of their elements.</li> </ul>
<ul style="list-style-type: none"> <li>• Examples: Hydrogen, oxygen</li> </ul>	<ul style="list-style-type: none"> <li>• Example: Water</li> </ul>