Important Questions Class 9 Science Chapter 3: Chapter 3 "Atoms and Molecules" in Class 9 Science focuses on fundamental concepts of chemistry, explaining the idea that all matter is composed of atoms and molecules. It introduces laws of chemical combination, such as the Law of Conservation of Mass and the Law of Constant Proportion.

Key topics include Dalton's Atomic Theory, atomic mass, molecular mass, and Avogadro's number. The chapter also explains how to write chemical formulas, use the mole concept, and calculate the number of particles in substances. Understanding these principles forms the foundation for further study in chemistry.

Important Questions Class 9 Science Chapter 3 Overview

Chapter 3 "Atoms and Molecules" in Class 9 Science is vital for building a strong foundation in chemistry. Important questions from this chapter often cover topics like Dalton's Atomic Theory, laws of chemical combination, atomic and molecular masses, and the mole concept.

These questions test students' understanding of how matter is composed, how chemical reactions follow specific laws, and how to calculate quantities of substances. Mastery of these concepts is essential for grasping advanced chemistry topics, as they form the basis of understanding atomic interactions, chemical equations, and quantitative analysis in future studies.

Important Questions Class 9 Science Chapter 3 Atoms and Molecules

Below is the Important Questions Class 9 Science Chapter 3 Atoms and Molecules -

Question. 1. Name the scientist who laid the foundation of chemical sciences. How?
Answer. Two significant laws of chemical combination were established by Antoine Laurent Lavoisier.

Question. 2. Define law of conservation of mass.
Answer. It states that, 'Mass is neither created nor destroyed in a chemical reaction.' In other words, the mass of the reactants must be equal to the mass of products.

Question. 3. Define law of constant proportion.
Answer. It states that, 'In a pure chemical substance, the elements are always present in definite proportions by mass'.

Question. 4. Which organisation approves the names of elements all over the world? Write the symbol of gold.
Answer.

- International Union of Pure and Applied Chemistry (IUPAG).
- Au.

Question. 5. Write atomicity of the following:
(i) Sulphur, (ii) Phosphorus
Answer. (i) Polyatomic, (ii) Tetra atomic.

Question. 6. Define atomicity.
Answer. The number of atoms present in one molecule of an element, or a compound is known as its atomicity.

Question. 7. What are polyatomic ions? Give two examples.
Answer. A group of atoms having a charge is known as polyatomic ion.

Question. 8. Give one relevant reason why scientists choose 1/16 of the mass of an atom of naturally occurring oxygen as the atomic mass unit.
Answer. Initially 1/16th of the mass of naturally occurring oxygen was taken as the atomic mass unit because this unit gave masses of most of the elements as whole numbers.

Question. 9. The relative atomic mass of oxygen atom is 16. Explain its meaning.
Answer. The relative atomic mass of an atom is the average mass of the atom, as compared to 1/12th the mass of one carbon-12 atom.

Question. 10. Distinguish between molecular mass and molar mass.
Answer. The mass of one mole of any substance is known as its molar mass, while the molecular mass of a substance is the sum of the atomic masses of all the atoms in a molecule.

Question. 11. Which postulate of Dalton's atomic theory is the result of the law of conservation of mass?
Answer. Atoms are indivisible particles, which cannot be created or destroyed in a chemical reaction.

Question. 12. Name the scientists whose experimentation established laws of chemical combination. Name the laws also.
Answer. Two rules of chemical combination were established by Antoine Laurent Lavoisier and Joseph L. Broust's experiments. (i) The Law of Conservation of Mass is one of these laws.
(ii) The law of proportionality.

Question. 13. Give two drawbacks of Dalton's atomic theory.
Answer. Drawbacks of Dalton's Atomic Theory:
(i) The atom is not the ultimate indivisible particle of matter, according to contemporary thought. Since atoms are composed of protons, electrons, neutrons, and other particles, we now know

that they are divisible.
(ii) The notion that atoms of the same element have the same mass is not valid when it comes to isotopes of that element.

Question. 14. State the law of conservation of mass. Is this law applicable to the chemical reactions ? Elaborate your answer with the help of an example. [SAII-2014]
Answer. According to the law of conservation of mass, mass cannot be produced or destroyed during a chemical process.
Yes, chemical reactions are covered by this law.
Only the exchange of reactants occurs when products are generated in all chemical reactions. Mass is neither gained nor lost.
For instance, the total mass of the reactants and products generated in the subsequent reaction is equal.

Question. 15. (a) Why does not atomic mass of an element represent the actual mass of its atom?
(b) "The atomic mass of an element is in fraction." What does it mean?
Answer. (a) The actual masses of many elements are minuscule, as are their atoms. We take the element's relative atomic mass into account in order to overcome this issue. Hydrogen has a relative atomic mass of 1 u and a gramme atomic mass of 1 g.
(b) An element exists in the form of isotopes if its atomic mass is in a fraction. Such an element's atomic mass is typically expressed as a fraction and is the average of the atomic masses of its isotopes.

Question. 16. Explain why the number of atoms in one mole of hydrogen gas is double the number of atoms in one mote of Helium gas?
Answer. One mole of hydrogen gas has twice as many atoms as one mole of helium gas due to the fact that hydrogen molecules are diatomic—that is, they are made up of two hydrogen atoms—while helium molecules are monoatomic.

Question. 17. Why atoms form ions?
Answer. In order to become stable by acquiring the stable electronic configuration of nearest noble gas.

Benefits of Solving Important Questions Class 9 Science Chapter 3

Solving important questions from Chapter 3 "Atoms and Molecules" in Class 9 Science offers several key benefits:

Enhanced Conceptual Clarity: By practicing questions on atomic theory, chemical laws, and molecular mass, students develop a deeper understanding of the core concepts, helping them grasp the basics of chemistry more effectively.

Application of Theoretical Knowledge: Important questions test the practical application of theoretical concepts like the Law of Conservation of Mass, the Law of Constant Proportion, and Dalton's Atomic Theory. Solving them reinforces learning through real-world chemical problems.

Improved Problem-Solving Skills: Questions based on atomic mass, molecular formulas, and the mole concept encourage analytical thinking and enhance problem-solving abilities. This sharpens mathematical skills crucial for future chemistry calculations.

Better Exam Preparation: These questions are designed to reflect typical exam patterns, enabling students to familiarize themselves with the format, marking scheme, and important areas that are likely to be covered in exams. It helps reduce anxiety by giving them a feel of what to expect.

Stronger Foundation for Higher Studies: Understanding atoms and molecules is fundamental for advanced chemistry. Solving detailed questions ensures that students build a strong foundation, preparing them for more complex topics in higher grades.