

CLASS 9

SCIENCE

EXTRA QUESTIONS

Class 9 Science Chapter 9 Atomic Foundations of Matter – Extra Questions with Answers

Extra practice questions for Class 9 Science Chapter 9 (Atomic Foundations of Matter), beyond the textbook. These Class 9 Science Chapter 9 important questions are handy for last-minute exam practice.

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Very Short Answer Questions (1 mark)

Short Answer Questions (2–3 marks)

Higher-Order Thinking / Application Questions

Extra practice questions for Class 9 Science Chapter 9 (Atomic Foundations of Matter), beyond the textbook. These Class 9 Science Chapter 9 important questions are handy for last-minute exam practice.

Very Short Answer Questions (1 mark)

Q1. State the law of conservation of mass in one line.

Ans: Mass can neither be created nor destroyed in a chemical reaction.

Q2. Who proposed the atomic theory based on the laws of chemical combination?

Ans: John Dalton.

Q3. Name the method used to write chemical formulae using valency.

Ans: Criss-cross method.

Q4. Do ionic compounds form by sharing or transferring electrons?

Ans: Transferring electrons.

Q5. What is molecular mass?

Ans: The sum of the atomic masses of all atoms in a molecule.

Short Answer Questions (2–3 marks)

Q6. Use the criss-cross method to write the chemical formula for aluminium oxide, given Al has valency 3 and oxygen has valency 2.

Ans: Al's valency (3) becomes the subscript for O, and O's valency (2) becomes the subscript for Al, giving Al_2O_3 (aluminium oxide).

Q7. Explain why formula unit mass, not molecular mass, is used for ionic compounds like sodium chloride.

Ans: Ionic compounds like NaCl don't exist as discrete, individual molecules — they form a continuous lattice of oppositely charged ions. So instead of "molecular mass," we calculate the formula unit mass, which sums the atomic masses of atoms in the simplest whole-number ratio (formula unit) representing the compound.

Q8. A 10 g sample of water is decomposed into hydrogen and oxygen. Using the law of conservation of mass, what should be true about the combined mass of hydrogen and oxygen produced?

Ans: According to the law of conservation of mass, the combined mass of hydrogen and oxygen produced must equal the original mass of water decomposed, i.e. 10 g total (in the fixed 1:8 ratio by mass for hydrogen to oxygen).

Higher-Order Thinking / Application Questions

Q9. A student claims that since 2 g of hydrogen combines with 16 g of oxygen to form water in one experiment, and 4 g of hydrogen combines with 32 g of oxygen to form water in another, the law of constant proportions is violated because the amounts are different. Explain why the student is mistaken.

Ans: The student is mistaken because the law of constant proportions concerns the ratio of elements combining, not the absolute amounts. In both experiments, the ratio of hydrogen to oxygen is 1:8 (2:16 and 4:32 both simplify to 1:8), so the law is upheld — only the total quantity of water produced differs, not the fixed proportion of the elements within it.

Q10. Calcium has valency 2, and carbonate (a polyatomic ion) has valency 2 (as a group). Determine the chemical formula for calcium carbonate, and calculate its formula unit mass given atomic masses Ca=40, C=12, O=16.

Ans: Since both valencies are 2, they cancel in the criss-cross method (ratio simplifies to 1:1), giving the formula CaCO_3 . Formula unit mass = 40 (Ca) + 12 (C) + 3×16 (O_3) = 40 + 12 + 48 = 100.

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