



INDIAN SCHOOL AL WADI AL KABIR

Class: IX	Department: SCIENCE 2020 -21 SUBJECT : CHEMISTRY	Date of completion: 11-02-21
Worksheet No: 04 WITH ANSWERS	CHAPTER: ATOMS AND MOLECULES	Note: A4 FILE FORMAT
Name of the student:	Class & Sec:	Roll No:

OBJECTIVE TYPE QUESTIONS
MULTIPLE CHOICE QUESTIONS

- The atomicities of ozone, sulphur, phosphorus and argon are respectively:
(a) 8,3,4 and 1 (b) 1,3,4 and 8 (c) 4,1,8 and 3 (d) 3,8,4 and 1
- The Latin language name of an element is natrium. The English name of this element is:
(a) Sodium (b)potassium (c) magnesium (d) sulphur
- The combining capacity of an atom is called :
(a)Atomicity (b)Valency (c) Atomic number (d)Atomic Mass
- How many atoms are present in 1mole of carbon?
(a)12 (b)6.022 (c)6.022 x10²³ (d)6.022x10
- In water, the proportion of oxygen and hydrogen by mass is:
(a) 1:4 (b) 1:8 (c) 4:1 (d) 8:1

ASSERTION-REASONING QUESTIONS

For the following questions, two statements are given-one labelled Assertion (A) and the other labelled Reason(R). Select the correct answer to these questions from the options

(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.

- Assertion: Ozone is triatomic molecule.
Reason: Ozone has three molecules of oxygen in it.
- Assertion: The atomic mass of an element is same as mass of the ion of the element.
Reason: Atomic mass does not depend on number of electrons in an atom.
- Assertion: Ions are charged particles.
Reason: Ions are formed by loss of electrons.

ONE MARK QUESTIONS

9. What is meant by atomicity?
10. Give two examples for cations.
11. Name the elements present in the following:
(a) Water (b) ammonia (c) sulphur dioxide
12. Define molecular mass of a substance.
13. Explain the difference between 2N and N₂

THREE MARK QUESTIONS

14. Write the formulae of:
(a) Magnesium hydroxide (b) Hydrogen sulphide (c) Potassium chloride
(d) Calcium oxide (e) Barium chloride (f) Sodium carbonate
15. (a) How do you differentiate between a molecule of an element and a molecule of a compound? Write one example of each.
(b) Write the chemical formula of baking soda.
16. (a) What are polyatomic ions?
(b) Write the formulae and names of the compounds formed by combination of
(i) Fe³⁺ and SO₄²⁻ (ii) NH₄⁺ and CO₃²⁻

FIVE MARK QUESTIONS

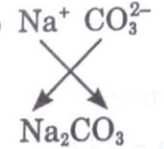

17. (a) Define atomic mass unit.
(b) Distinguish between molecular mass and molar mass.
(c) Give an example of diatomic and triatomic molecule of compounds.
18. Calculate the number of moles present in (a) 60 g of Calcium (b) 3.011 x 10²³ number of oxygen atoms. [Given that Ca=40u, Avogadro no-6.022 x 10²³]
19. (a) What is an ion? Write the symbol for calcium ion and aluminium ion
(b) Give the difference between an anion and a cation.
(c) How many atoms are present in one molecule of ozone?
20. (i) Calculate the number of moles in 34g of NH₃. [Given atomic mass of N=14u, H=1u]
(ii) Write the chemical formulae of: (a) Sodium carbonate (b) Ammonium chloride.

PREVIOUS YEAR BOARD QUESTIONS

21. Calculate the formula unit mass of CuSO₄.5H₂O
[Atomic mass of Cu=63.5u, S=32u, O=16u, H=1u]
22. (a) Calculate the mass of 0.5 mole of sulphuric acid. [Atomic mass H=1u, S=32u, O=16u]
(b) Find the number of atoms in 12g of carbon.
(c) How many atoms are present in (i) H₂S molecule (ii) PO₄³⁻ ions?
(d) Write the names of elements present in (i) quick lime (ii) hydrogen bromide.
23. Calculate the molar mass of the following:
(i) HNO₃ (ii) CH₃COOH
24. Calculate the formula unit masses of ZnO, Na₂O, K₂CO₃ [Zn=65u, Na=23u, K=39u, C=12u, O=16u]
25. Define the term gram atom. What is Avogadro number constant?

15	<p>(a) Molecule of an element contains same kind of atoms. Eg:-P₄ is a molecule of element which contains four atoms of phosphorus. Molecule of a compound contains different kinds of atoms. Eg:- H₂O- is a molecule of compound which contains 2 atoms of hydrogen and one atom of oxygen.</p> <p>(b) NaHCO₃ is the chemical formula of baking soda.</p>
16	<p>(a) Those ions which contain more than two atoms are called polyatomic ions.</p> <p>(b) (i) Fe₂(SO₄)₃ (ii) (NH₄)₂CO₃</p>

FIVE MARK QUESTIONS

17	<p>(a) It is defined as 1/12 th of the mass of 1 atom of carbon-12.</p> <p>(b) Molecular mass is the mass of one molecule. molar mass is the mass of 6.022 x 10²³ molecules(1 mole)</p> <p>(c) (i) HCl is a diatomic molecule of compound. (ii) H₂O is a triatomic molecule of compound.</p>
18	<p>(a) $\text{Number of moles of Ca} = \frac{\text{Given mass of Calcium}}{\text{Molar mass of Calcium}}$ $= \frac{60}{40} = 1.5 \text{ moles}$</p> <p>(b) $\text{Number of moles} = \frac{\text{Given No. of molecules}}{6.022 \times 10^{23}}$ $= \frac{3.011 \times 10^{23}}{6.022 \times 10^{23}} = 0.5 \text{ mol}$</p>
19	<p>(a) Charged atom is called an ion. Calcium ion is Ca²⁺ and Aluminium ion is Al³⁺</p> <p>(b) Anion-positively charged ion. Cation-Negatively charged ion.</p> <p>(c) 3 Oxygen atoms.</p>
20	<p>1. Molar mass of NH₃ = 14 + 3 × 1 = 17 g mol⁻¹</p> <p>Number of moles of NH₃ = $\frac{\text{Given mass}}{\text{Molar mass of NH}_3}$ $= \frac{34}{17} = 2 \text{ moles}$</p> <p>2. (a) $\text{Na}^+ \text{CO}_3^{2-}$ (b) $\text{NH}_4^+ \text{Cl}^-$</p> <p style="text-align: center;">   </p>

PREVIOUS YEAR BOARD QUESTIONS

21	Formula unit mass of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O} = 1 \times 63.5 + 1 \times 32 + 4 \times 16 + 5[2 \times 1 + 1 \times 16]$ $= 63.5 + 32 + 64 + 90$ $= 249.5\text{u}$
22	(a) 1 mole of sulphuric acid = $1 \times 2 + 32 \times 1 + 16 \times 4 = 98 \text{ g}$ 0.5 mole of sulphuric acid = $\frac{98}{2} = 49 \text{ g}$ (b) 1 mole of carbon = $12 \text{ g} = 6.022 \times 10^{23}$ atoms (c) (i) H_2S molecule has three atoms. (ii) PO_4^{3-} ions have 4 atoms each. d) (i) Quicklime is Ca(OH)_2 . Atoms present are calcium, oxygen and hydrogen. (ii) Hydrogen bromide is HBr . Atoms present are hydrogen and bromine.
23	(i) HNO_3 $1 \times 1 + 1 \times 14 + 3 \times 16 = 63\text{g}$ (ii) CH_3COOH $1 \times 12 + 3 \times 1 + 1 \times 12 + 1 \times 16 + 1 \times 16 + 1 \times 1 = 60\text{g}$
24	ZnO $65 + 16 = 81\text{u}$ Na_2O $23 \times 2 + 16 = 62\text{u}$ K_2CO_3 $39 \times 2 + 12 \times 1 + 16 \times 3 = 138\text{u}$
25	The atomic mass of an element expressed in grams is called gram atomic mass or gram atom. Avogadro constant - 6.022×10^{23}

EXEMPLAR QUESTIONS

26	$\text{CuCl}_2, \text{CuSO}_4, \text{Cu}_3(\text{PO}_4)_2, \text{NaCl}, \text{Na}_2\text{SO}_4, \text{Na}_3\text{PO}_4, \text{FeCl}_3, \text{Fe}_2(\text{SO}_4)_3, \text{FePO}_4$		
27	Compound	Chemical formulae	Ratio by mass
	Ammonia	NH_3	14:3
	Carbon monoxide	CO	3:4
	Hydrogen chloride	HCl	1:35.5(2:71)
	Aluminium fluoride	AlF_3	9:19
	Magnesium sulphide	MgS	3:4

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