FREEDOM INTERNATIONAL SCHOOL

GRADE: IX **SUBJECT: CHEMISTRY**

ATOMS AND MOLECULES

---

1. Define atomic mass unit.
2. Define atomicity.
3. Give an example each for a triatomic and polyatomic molecule.
4. Define law of constant proportion.
5. Name the anion and cation present in magnesium oxide.
6. An element has valency 3, write down the formula of its oxide.
7. Name the international organization which approves the name given for elements.
8. The oxide of aluminium has a chemical formula Al_2O_3. State the valency of Al.
9. Give any three differences between anions and cations.
10. Write the names of the following compounds (a)$Al_2(SO_4)_3$ (b)NH_4OH.
11. Give the chemical formula of zinc hydroxide, potassium phosphate and ammonium sulphite.
12. Hydrogen and oxygen combine in the ratio 1:8 by mass to form water. What mass of oxygen is required to react completely with 4g of hydrogen gas?
13. Give one word for the following:
    (a) Positively charged ion.
    (b) A group of atoms carrying charge.

14. Mention any two important rules to write chemical formulae.
15. How would you differentiate a molecule of an element and a molecule of a compound? Write one example for each type.
16. Define the valency of an element in a molecule and the valency of an ion in an ionic compound.
17. Name the compound formed by the combination (a) Fe^{3+} and SO_4^{2-} (b) NH^{4+} and CO_3^{-2}.
18. Define one mole and how is it related to Avogadro number.
19. Write down the chemical formulae of all the compounds that can be formed by the combination of the following elements Ca^{2+}, K^{+}, Fe^{3+}, Cl^{-} and SO_2^{-2}.
20. Write down the formulae for ammonium sulphate and ammonium sulphite.
21. Using mole concept, calculate the mass of 1 molecule of CO_2.
22. Calculate the number of carbon atoms present in a black dot marked on the paper with a graphite pencil. Given that the dot has a mass of one atto-gram (10^{-18} g).

NUMERICALS:

1. How many atoms are present in one molecule of ozone?
2. How many atoms are there in one gram of hydrogen?
3. Calculate the number of moles in 34 g of ammonia (NH_3).

4. 2.8 g of nitrogen was allowed to react with 0.6 g of hydrogen to produce 3.4 grams of ammonia. Show that these observations are in agreement with the law of conservation of mass.
5. Calculate the number of moles in
   (a) 8g of oxygen gas.
   (b) 52 g of helium.
6. Calculate the mass of 3.011×10^{23} atoms of N. (atomic mass of N is 14)
7. Calculate the number of moles in
   (a) 64 g of oxygen atoms.
   (b) 24×10^{23} atoms of oxygen.
   (atomic mass of O=16)
8. The mass of a single atom of an element is 2.65×10^{-23} g. Calculate its atomic mass. ($N_A = 6.022 \times 10^{23}$)
9. How many molecules are present in (a) 7 g of water (b) 17 g of NH_3?
10. Calculate number of moles in 120g of calcium and 120g of iron. Which has more number of atoms? (atomic mass of Ca=40 and Fe=56)
11. Calculate the number of oxygen atoms in 0.10 moles of $Na_2CO_3.10H_2O$.
12. If one mole of sulphur weighs 32 g, what is the mass of one atom of sulphur?
13. Calculate the molar mass of sugar ($C_{12}H_{22}O_{11}$) and $NaHCO_3$.