

2.3 Molecular Weight MCQs

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- What is the molecular mass of a substance?
A) The mass of one atom of the substance
B) The number of times a molecule is heavier than $1/12$ th of the C-12 isotope
C) The total number of atoms in a molecule
D) The mass of the substance in grams
- The molecular mass of water (H_2O) is:
A) 16 amu B) 18 amu C) 20 amu D) 2 amu
- The molecular mass of NaCl is: (Na=23, Cl=35.5)
A) 58.5 amu B) 23 amu C) 35.5 amu D) 100 amu
- The molecular mass of H_2SO_4 is: (H=1, S=32, O=16)
A) 49 amu B) 98 amu C) 64 amu D) 32 amu
- Which of the following is NOT a correct statement about molecular mass?
A) It is the sum of atomic masses of all atoms in a molecule
B) It is expressed in amu
C) It is always greater than atomic mass
D) It is the same as gram molecular mass
- One gram molecule of any substance means:
A) The molecular mass expressed in kilograms
B) The molecular mass expressed in grams
C) 1 gram of the substance
D) 100 grams of the substance
- If the molecular mass of CO_2 is 44 amu, then 44 g of CO_2 equals:
A) 1 gram atom of CO_2
B) 1 gram molecule of CO_2
C) 2 gram molecules of CO_2
D) 0.5 gram molecule of CO_2
- How many gram molecules are present in 36g of water? (Molecular mass of water = 18)
A) 1 gram molecule B) 2 gram molecules C) 3 gram molec
- The gram molecular mass of oxygen (O_2) is:
A) 16 g B) 32 g C) 48 g D) 8 g
- If the molecular mass of a substance is 40 amu, then 80g of the substance contains:
A) 1 gram molecule B) 2 gram molecules C) 3 gram molecules D) 4 gram molecules
- Avogadro's hypothesis states that:
A) Equal volumes of all gases have equal masses
B) Equal volumes of all gases contain equal number of molecules at same T & P
C) All gases have the same density
D) Gases expand equally on heating
- Which gas is diatomic according to Avogadro's hypothesis?
A) Helium (He) B) Neon (Ne) C) Hydrogen (H_2) D) Argon (Ar)
- Vapour density is defined as:
A) Mass of gas $\div$ Mass of same volume of oxygen
B) Mass of gas $\div$ Mass of same volume of hydrogen
C) Mass of gas $\div$ Mass of same volume of air
D) Mass of gas $\div$ Mass of same volume of water
- The relationship between molecular weight and vapour density is:
A) Molecular weight = Vapour density
B) Molecular weight = $2 \times$ Vapour density

- C) Molecular weight = Vapour density $\div$ 2
 D) Molecular weight = 4 $\times$ Vapour density
15. If the vapour density of a gas is 16, its molecular mass is:
 A) 8 amu B) 16 amu C) 32 amu D) 64 amu
 16. If the molecular mass of a gas is 44 amu, its vapour density is:
 A) 11 B) 22 C) 44 D) 88
 17. What is the vapour density of oxygen gas (O_2 , molecular mass = 32)?
 A) 8 B) 16 C) 32 D) 64
 18. Vapour density is always:
 A) Greater than molecular weight
 B) Equal to molecular weight
 C) Half of molecular weight
 D) Double of molecular weight
 19. If the vapour density of a gas is 14, the gas could be:
 A) H_2 (2) B) N_2 (28) C) O_2 (32) D) CO_2 (44)
 20. The molecular weight of a gas is 28 amu. Its vapour density is:
 A) 7 B) 14 C) 28 D) 56
 21. Avogadro's number is the number of molecules present in
 a. 1 g of atoms b. 1 g of molecules c. gram molecular mass d. 1 litre of molecules
 22. One litre of a gas at NTP weighs 1.16 g. The gas might be
 a. O_2 b. CO_2 c. C_2H_2 d. C_2H_6
 23. According to Avogadro's hypothesis, 1 litre of hydrogen at NTP contains:
 A) More molecules than 1 litre of oxygen
 B) Fewer molecules than 1 litre of oxygen
 C) Same number of molecules as 1 litre of oxygen
 D) Half the molecules of oxygen
 24. NTP stands for:
 A) Normal Temperature and Pressure ($0^\circ C$, 1 atm)
 B) Normal Time and Place
 C) New Temperature Protocol
 D) Natural Testing Point
 25. In the reaction: $H_2 + Cl_2 \rightarrow 2HCl$, 1 volume of H_2 reacts with 1 volume of Cl_2 to produce:
 A) 1 volume of HCl B) 2 volumes of HCl C) 3 volumes of HCl D) 4 volumes of HCl
 26. Avogadro's number (N_A) has the value:
 A) 6.023×10^{22} B) 6.023×10^{23} C) 6.023×10^{24} D) 6.023×10^{25}
 27. Which of the following is TRUE about Avogadro's number?
 A) It applies only to gases
 B) It applies to all substances (solid, liquid, gas)
 C) It applies only to liquids
 D) It applies only to solids
 28. One mole of any substance contains:
 A) 6.023×10^{22} particles
 B) 6.023×10^{23} particles
 C) 6.023×10^{24} particles
 D) 6.023×10^{25} particles
 29. In the reaction: $N_2 + 3H_2 \rightarrow 2NH_3$, the volume ratio of N_2 to H_2 is:
 A) 1:1 B) 1:2 C) 1:3 D) 2:3
 30. The gram molecular volume of any gas at NTP is:
 A) 22.4 mL B) 22.4 L C) 2.24 L D) 224 L
 31. Which of the following is NOT a deduction from Avogadro's hypothesis?

- A) Gases expand on heating
 - B) Molecular weight = $2 \times \text{Vapour density}$
 - C) Gram molecular volume = 22.4 L
 - D) Gases are diatomic
32. One gram molecular volume of any gas at NTP is equal to:
- A) 22.4 L and contains 6.023×10^{23} molecules
 - B) 22.4 L but contains a different number of molecules
 - C) 22.4 mL and contains 6.023×10^{23} molecules
 - D) 22.4 L and contains 6.023×10^{22} molecules
33. Victor Meyer's method is used to determine:
- A) Atomic mass of metals
 - B) Molecular mass of volatile liquids
 - C) Density of solids
 - D) Boiling point of liquids
34. In Victor Meyer's method, the volatile liquid is vaporised and displaces:
- A) Water vapour
 - B) Equal volume of air
 - C) Mercury vapour
 - D) Hydrogen gas
35. The volume of displaced air in Victor Meyer's method is equal to:
- A) Volume of liquid taken
 - B) Volume of vapour formed
 - C) Volume of apparatus
 - D) Volume of water used
36. In Victor Meyer's method, the gas volume is corrected to:
- A) NTP (STP)
 - B) Room temperature only
 - C) Atmospheric pressure only
 - D) Boiling point
37. A volatile liquid is one that:
- A) Boils at very high temperature
 - B) Easily changes into vapour
 - C) Does not evaporate
 - D) Is very heavy
38. In Victor Meyer method, 0.12 g of liquid displaced 45.6 mL air. The molecular weight would be calculated using:
- A) $\text{Mass of liquid} \times 22400 \div \text{Volume at STP}$
 - B) $\text{Volume at STP} \times 22400 \div \text{Mass}$
 - C) $\text{Mass} \times \text{Volume} \div 22400$
 - D) $\text{Mass} + \text{Volume} \times 22400$
39. The molar volume (22.4 L) is used in Victor Meyer calculation because:
- A) One mole of any gas occupies 22.4 L at NTP
 - B) All liquids occupy 22.4 L
 - C) It is a random number
 - D) Solids also occupy 22.4 L
40. In Victor Meyer's method, the mass of volatile liquid should be:
- A) Very large
 - B) Small and accurately weighed
 - C) Equal to volume of apparatus
 - D) Any amount
41. The aqueous tension is subtracted while calculating:
- A) Mass of liquid
 - B) Volume of gas at STP
 - C) Molecular mass directly
 - D) Vapour density

42. If the molecular weight of a volatile liquid is determined by Victor Meyer's method, the vapour density can be obtained by:
- A) Molecular weight $\times$ 2
 - B) Molecular weight $\div$ 2
 - C) Molecular weight + 2
 - D) Molecular weight - 2

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