

What Is Molar Mass?

Worksheet

Molar mass (M) is the mass in grams of one mole of a substance: $M = m/n$, found by summing the atomic masses of all atoms in a formula (in g/mol).

$$M = \frac{m}{n}$$

Questions

1. Molar mass is measured in:

- A) g
- B) mol
- C) g/mol
- D) L/mol

2. Molar mass of CO₂ (C=12.01, O=16.00)?

- A) 28.01 g/mol
- B) 32.00 g/mol
- C) 44.01 g/mol
- D) 16.00 g/mol

3. 58.5 g of a substance is 1.00 mol. Its molar mass is:

- A) 1.00 g/mol
- B) 58.5 g/mol
- C) 5.85 g/mol
- D) 585 g/mol

4. To find a compound's molar mass you:

- A) Multiply all atomic masses together
- B) Add atomic mass subscript for each element
- C) Divide the largest atomic mass by 2
- D) Use only the heaviest atom's mass

5. Find the molar mass of water, H₂O. (H=1.01, O=16.00 g/mol)

6. Find the molar mass of carbon dioxide, CO₂. (C=12.01, O=16.00)

7. A sample of NaCl has a mass of 58.5 g and contains 1.00 mol. Find its molar mass and confirm.

8. Define: What is molar mass?

9. Define: Formula for molar mass?

10. Define: How do you find the molar mass of a compound?

Answer Key

1. C) g/mol - Molar mass is mass per mole, so its unit is g/mol.
2. C) 44.01 g/mol - $M = 12.01 + 2(16.00) = 44.01$ g/mol.
3. B) 58.5 g/mol - $M = m/n = 58.5/1.00 = 58.5$ g/mol.
4. B) Add atomic mass subscript for each element - Sum (atomic mass number of atoms) for every element in the formula.
5. $M = 2M(\text{H}) + 1M(\text{O})$ $M = 2(1.01) + 16.00 = 2.02 + 16.00 = 18.02$ g/mol
6. $M = 1M(\text{C}) + 2M(\text{O})$ $M = 12.01 + 2(16.00) = 12.01 + 32.00 = 44.01$ g/mol
7. $M = m/n = 58.5 \text{ g} / 1.00 \text{ mol} = 58.5 \text{ g/mol}$ Check by formula: $\text{Na} = 22.99 + \text{Cl} = 35.45 = 58.44$ g/mol Values agree (rounding)
8. The mass of one mole of a substance, in grams per mole (g/mol).
9. $M = m/n$, where m is mass in grams and n is amount in moles.
10. Add up (atomic mass number of atoms) for every element in the formula.

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