

Molar Mass

Chem Worksheet 11-2

Name _____

The term **mole** is used in chemistry as a method for counting or grouping atoms. In the same way that a dozen is used to count eggs, the mole is used for counting very tiny particles such as atoms and molecules. The **mass** of an object is related to its weight. Masses are reported in grams. The mass of a mole of atoms is called the **molar mass**. A mole of carbon atoms is 12.0 grams while a mole of oxygen atoms is 16.0 grams.

Molar mass of carbon dioxide (CO₂)

6 C 12.011 carbon	8 O 15.999 oxygen
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Molar mass Molar mass

↓ ↓

12.01 g/mol + 2 × 16.00 g/mol

= 44.01 g/mol

<u>Name</u>	<u>Symbol</u>	<u>Molar Mass</u>
carbon atom	C	12.01 g/mol
oxygen atom	O	16.00 g/mol
oxygen molecule	O ₂	32.00 g/mol
potassium nitrate	KNO ₃	101.11 g/mol
calcium carbonate dihydrate	CaCO ₃ · 2H ₂ O	136.13 g/mol

example

What is the molar mass of iron (II) nitrate, Fe(NO₃)₂?

- add the masses of all the atoms: $55.85 + 2(14.01) + 6(16.00) = 179.87 \text{ g/mol}$

Answer the following questions.

1. What is the molar mass of argon (Ar)?
2. Find the molar mass of gold (Au).
3. Hydrogen peroxide, H₂O₂ is used as an antiseptic. What is its molar mass?
4. What is the molar mass of calcium carbonate, CaCO₃?
5. Lye is the common name for sodium hydroxide, NaOH. What is its molar mass?
6. Perfluoroethylene, C₂F₄ is polymerized into Teflon, a chemical used to coat non-stick surfaces. What is its molar mass?
7. Find the molar mass of acetylene C₂H₂, the gas used in welding torches.
8. Vinegar contains acetic acid, HC₂H₃O₂. What is the molar mass of this substance?
9. What is the molar mass of magnesium sulfate, MgSO₄?
10. Find the molar mass of phosphorus pentachloride, PCl₅.
11. Bromine is diatomic. Find the molar mass of the bromine molecule, Br₂.
12. What is the molar mass of phosphoric acid, H₃PO₄?
13. Rubbing alcohol has the chemical formula C₃H₇OH. Find its molar mass.
14. What is the molar mass of aluminum sulfate, Al₂(SO₄)₃?
15. Vitamin C is also called ascorbic acid, C₆H₈O₆. What is its molar mass?
16. What is the molar mass of Freon-113 (C₂F₃Cl₃)?
17. A diatomic gas has the molar mass 38.00 g/mol. What is a possible formula?
18. Find the molar mass of aspirin, C₇H₆O₃.
19. What is the molar mass of potassium hydrogen phthalate, KHC₈H₄O₄?
20. A hydrocarbon has the molar mass 26.04 g/mol. What is a possible formula?