

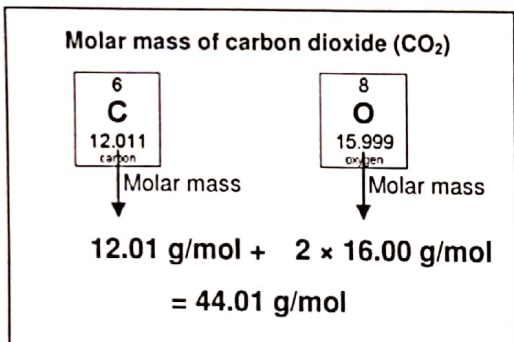
work is shown on

Molar Mass
Chem Worksheet 11-2

page 2

Name KEY

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.



Name	Symbol	Molar Mass
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: $55.85 + 2(14.01) + 6(16.00) = 179.87 \text{ g/mol}$

use periodic table to find masses

Answer the following questions.

- What is the molar mass of argon (Ar)? 39.948 g/mol
- Find the molar mass of gold (Au). 196.967 g/mol
- Hydrogen peroxide, H₂O₂ is used as an antiseptic. What is its molar mass? 34.014 g/mol
- What is the molar mass of calcium carbonate, CaCO₃? 100.086 g/mol
- Lye is the common name for sodium hydroxide, NaOH. What is its molar mass? 39.988 g/mol
- Perfluoroethylene, C₂F₄ is polymerized into Teflon, a chemical used to coat non-stick surfaces. What is its molar mass? 100.014 g/mol
- Find the molar mass of acetylene C₂H₂, the gas used in welding torches. 26.038 g/mol
- Vinegar contains acetic acid, HC₂H₃O₂. What is the molar mass of this substance? 60.052 g/mol
- What is the molar mass of magnesium sulfate, MgSO₄? 120.367 g/mol
- Find the molar mass of phosphorus pentachloride, PCl₅. 208.239 g/mol
- Bromine is diatomic. Find the molar mass of the bromine molecule, Br₂. 159.808 g/mol
- What is the molar mass of phosphoric acid, H₃PO₄? 97.994 g/mol
- Rubbing alcohol has the chemical formula C₃H₇OH. Find its molar mass. 60.096 g/mol
- What is the molar mass of aluminum sulfate, Al₂(SO₄)₃? 342.15 g/mol
- Vitamin C is also called ascorbic acid, C₆H₈O₆. What is its molar mass? 176.124 g/mol
- What is the molar mass of Freon-113 (C₂F₃Cl₃)? 187.375 g/mol
- A diatomic gas has the molar mass 38.00 g/mol. What is a possible formula? F_2
- Find the molar mass of aspirin, C₉H₈O₄. 180.15 g/mol
- What is the molar mass of potassium hydrogen phthalate, KHC₈H₄O₄? 204.222 g/mol
- A hydrocarbon has the molar mass 26.04 g/mol. What is a possible formula? C_2H_2

Molar Mass Worksheet

- 39.948 (from periodic table)
- 196.967 (from periodic table)
- H_2O_2
 $2(1.008) + 2(15.999)$
- CaCO_3
 $40.078 + 12.011 + 3(15.999)$
- NaOH
 $22.990 + 15.999 + 1.008$
- C_2F_4
 $2(12.011) + 4(18.998)$
- C_2H_2
 $2(12.011) + 2(1.008)$
- $\text{HC}_2\text{H}_3\text{O}_2$
 $1.008 + 2(12.011) + 3(1.008) + 2(15.999)$
- MgSO_4
 $24.305 + 32.066 + 4(15.999)$
- Br_2
 $2(79.904)$
- H_3PO_4
 $3(1.008) + 30.974 + 4(15.999)$
- $\text{C}_3\text{H}_7\text{OH}$
 $3(12.011) + 7(1.008) + 15.999 + 1.008$
- $\text{Al}_2(\text{SO}_4)_3$
 $2(26.982) + 3(32.066) + 12(15.999)$
- $\text{C}_6\text{H}_8\text{O}_6$
 $6(12.011) + 8(1.008) + 6(15.999)$
- $\text{C}_2\text{F}_3\text{Cl}_3$
 $2(12.011) + 3(18.998) + 3(35.453)$
- diatomic = 2 atoms
 $38 \div 2 = 19 \text{ g/mol}$
Fluorine = 19 g/mol
 F_2
- $\text{C}_7\text{H}_6\text{O}_3$
 $7(12.011) + 6(1.008) + 3(15.999)$

10. PCl_5
 $30.974 + 5(35.453)$

19. $\text{KHC}_8\text{H}_4\text{O}_4$
 $39.098 + 1.008 + 8(12.011) + 4(1.008) + 4(15.999)$

20. $26.04 \text{ g/mol} = ?$
hydrocarbon = made of
H + C
 $\downarrow \quad \downarrow$
1.008 12.011
 $\times 2 \quad \times$
 $\hline \approx 2 \quad \approx 24 \Rightarrow 26$
 C_2H_2