

Particle to Mole & Molar Mass (15pts)

Moles and Avogadro's Number

Hint: One mole of a substance contains Avogadro's Number (6.02×10^{23}) of molecules.

How many molecules are in the quantities below? SHOW WORK

1. 2.0 moles $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

2. 1.5 moles $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

3. 0.75 mole $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

4. 15 moles $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

How many moles are in the number of molecules below? SHOW WORK

1. 6.02×10^{23} molecules $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

2. 1.204×10^{24} molecules $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

3. 1.5×10^{20} molecules $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

4. 7.5×10^{19} molecules $\frac{\quad}{\quad} = \underline{\hspace{2cm}}$

Calculation of Molar Mass

Molar Mass = Mass of 1 mole of an ionic compound or covalent molecule

Calculation of Molar Mass—Sum of the atomic masses (from the periodic table) of all atoms present in the chemical formula

11 Na Atomic Mass → 22.990 Sodium	17 Cl Atomic Mass → 35.453 Chlorine
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Examples:

Calculate the molar mass of sodium chloride. Round the Molar Mass to the hundredths.

NaCl	1 Na	1 x 22.99 = 22.99 (Find the mass of Na on periodic table)
	1 Cl	1 x 35.45 = 35.45 (Find the mass of Cl on periodic table)
	Molar Mass	58.44 g/mole

Calculate the molar mass of ammonium sulfate

(NH ₄) ₂ SO ₄	2 N	2 x 14.01 = 28.02
	8 H	8 x 1.01 = 8.08
	1 S	1 x 32.07 = 32.07
	4 O	4 x 16.00 = 64.00
	Molar Mass	132.17 g/mole

Molar Mass Practice: Calculate the molar mass for the following compounds. SHOW WORK

1. LiCl

# of atoms	Element	Multiplication
Total Molar Mass =		

2. AlBr₃

# of atoms	Element	Multiplication
Total Molar Mass =		

3. $\text{Ca}(\text{NO}_3)_2$

# of atoms	Element	Multiplication
Total Molar Mass =		

4. $\text{Al}_2(\text{SO}_4)_3$

# of atoms	Element	Multiplication
Total Molar Mass =		