

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 <i>Atomic Mass</i> → 22.990 Sodium	17 Cl <i>Atomic Mass</i> → 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 =		