### Mole/Mass Conversions

### \*Note: [4.7.1: Mole Practice with Guidence (Exercises)](https://chem.libretexts.org/Courses/Chippewa_Valley_Technical_College/CVTC_Basic_Chemistry/04%3A_Chemical_Quantities/4.07%3A_Chapter_4_Exercises/4.7.01%3A_Mole_Practice_with_Guidence_%28Exercises%29) is shared under a [not declared](https://chem.libretexts.org/Courses/Chippewa_Valley_Technical_College/CVTC_Basic_Chemistry/04%3A_Chemical_Quantities/4.07%3A_Chapter_4_Exercises/4.7.01%3A_Mole_Practice_with_Guidence_%28Exercises%29) license and was authored, remixed, and/or curated by LibreTexts.

1. Find the amount of moles contained in each specimen.

1. 7.87 kg H2O2 n= m/M = 7870 g / 34.02 g\*mol-1 = 231.3 moles
2. 2.34 kg NaCl = 2340 g / 58.44 g\*mol-1 = 40.04 moles
3. 12.5 g C2H6O = 12.5 g / 46.08 g\*mol-1 = 0.271 moles
4. 85.72 g NH3  = 85.72g / 17.04 g\*mol-1  = 5.031 moles

2. Calculate the number of moles in each of the following examples.

1. 402.5 mg of NO2 n = m / M = 0.4025 g / 46.01 g\*mol-1  = 8.748 x 10-3 moles
2. 2.7 kg of H2O = 149.8 moles
3. 323 g of CBr4 = 3.51 moles
4. 2.9 kg of CaO = 51.8 moles

**Mass/Particle Conversions**

1. For each substance, convert the given molecules to mass in grams:

1. 3.2 x 1024 Cl2 molecules 5.3 moles x 70.9 g\*mol-1  = 375.77 g
2. 8.25 x 1018 CH2Omolecules 1.4 x 10-5 moles x 30.02 g\*mol-1  = 4.2 x 10-4 g
3. 1 carbon dioxide molecule 7.31 x 10-23 g

## **Using Moles & Avogadro's Number**

1. Calculate the number of atoms or ions of:

a. 2.00 mole of Fe 1.204 x 1024  atoms

b. 4.36 mol of Si 2.62 x 1024 atoms

c. 1.20 x 10-2 mol of Li+ 7.22 x 1021 ions

d. 0.875 mol of S2- 5.27 x 1023 ions

2. Calculate the number of molecules or formula units of:

a. 0.0950 mol of H2O  5.719 x 1022 molecules

b. 3.20 x 10-3 mol of NaCl 1.926 x 1021 units

c. 2.06 mol of CaBr2  1.24 x 1024  units

d. 0.14 mol of C6H12O6 (glucose) 8.428 x 1022 molecules

3. Calculate the number of moles from each of the following.

a. 6.95 x 1023 atoms of Cu 1.15 moles

b. 7.12 x 1021 molecules of CO2 1.18 x 10-2  moles

c. 3.33 x 1022ions of Pb4+  5.53 x 10-2 moles

d. 7.00  x 1023formula units of LiNO3 1.163 moles

e. 5.16 x 1020molecules of N2 8.57 x 10-4­ moles

## **Molar Mass**

1. Calculate the molar mass of each of the following:

(a) P4 123.88

(b) H2O 18.02

(c) Ca(NO3)2 164.1

(d) CH3CO2H (acetic acid) 60.06

(e) C12H22O11 (sucrose, cane sugar) 226.4