

Moles and Molar Mass

How do you count the number of atoms in a compound?

SO₃ (NH₄)₂SO₄ iron (III) hydroxide

How do you count the number of IONS in an ionic compound?

(NH₄)₂SO₄ iron (III) hydroxide

What is a MOLE?

A mole is a WORD that represents a NUMBER

602,000,000,000,000,000,000 or in scientific notation _____.

A substance that contains the same number of particles as the number of atoms in 12 g of carbon-12 is 1 mole of a substance. The number of particles in exactly one mole of a pure substance is known as **AVOGADRO'S NUMBER** and is approximately **6.02 x 10²³**.

If you had one molecule of CO₂, how many atoms of carbon would you have? Of oxygen atoms?

If you have one mole of CO₂, how many moles of carbon atoms would you have? Of oxygen atoms?

Number of carbon atoms?

Of oxygen atoms?

The process of counting by weight creates a connection between number of particles and mass in grams.

The mass (in grams) of one mole of a pure substance is known as the _____

The unit for molar mass is _____.

<i>formula mass</i>	<i>molar mass</i>	<i>molecular mass</i>
<i>formula weight</i>	<i>molar weight</i>	<i>molecular weight</i>

All of the above terms mean essentially the same thing:

the mass **in grams** of **one mole** of a substance.

Report molar mass to two decimal places.

MOLAR MASS OF ELEMENTS

-same as the average atomic mass from the periodic table (heads up for diatomics).

Helium

Calcium

Oxygen

MOLAR MASS OF COMPOUNDS

-computed by adding all of the masses of all of the atoms in the representative particle

Representative particle for IONIC compounds is _____.

Representative particle for COVALENT compounds is _____.

Find the formula mass for the following IONIC compound:

a. sodium sulfide

b. ammonium sulfite

Find the molecular mass for the following COVALENT compound:

a. nitrogen

b. diboron trioxide

HOMEWORK: Moles and Molar Mass**SHOW ALL WORK AS DIRECTED IN CLASS**

I. Find the molecular mass of the following compounds.

1. silicon dioxide
2. dinitrogen tetroxide
3. sulfur trioxide
4. fluorine

II. Find the formula mass of the following compounds.

5. cobalt (II) chloride
6. ammonium chromate
7. iron (III) permanganate
8. magnesium bromide