

Ch 10

Sec 10.1

HW: Sec Asses 9, 10, 13, 14 Rev Con 48, 49, 52

obj: How is Avogadro's number related to a mole of any substance?

Quantities in Chemistry

- We measure in chemistry by counting, by volume and by mass.

- In Chemistry, Quantities revolve around the mole.

* The mole is Like a dozen of something.

* The mole represents 6.02×10^{23} particles.

* Avogadro's number.

10/31/02 8:23 AM

* Used to form conversion factors.

1 mole = 6.02×10^{23} Rep Particles

$$\frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ R.P.}} \quad \frac{6.02 \times 10^{23} \text{ RP}}{1 \text{ mole}}$$
Representative Particles

- Smallest particle of the substance that has the properties of the substance

* Substances are elements or Compounds.

* The representative particles are atoms, molecules or formula Units.

Mole-Particle Conversions

- Changing btw particles and moles.

* Involves dimensional analysis.

Nov 3 - 8:42 AM

1.5 mole of CH_4 equals how many molecules?

Given

1.5 mol CH_4

Wanted

molecules of CH_4

1.5 mol CH_4	6.02×10^{23} molecules CH_4
	1 mol CH_4

Nov 3 - 8:46 AM

How many atoms of H are in 1.5 moles of CH_4 ?

Given

1.5 mol CH_4

Wanted
atoms of H.

1.5 mol CH_4	6.02×10^{23} molecules CH_4	4 H atoms
	1 mol CH_4	1 molecule CH_4

Nov 3 - 8:50 AM

How many moles are there in 5.09×10^{22} atoms of Fe?

$$1 \text{ mol} = 6.02 \times 10^{23} \text{ particles}$$

Given

$$5.09 \times 10^{22} \text{ atoms Fe}$$

Wanted

mol Fe

$$\frac{5.09 \times 10^{22} \text{ atoms Fe}}{6.02 \times 10^{23} \text{ atoms Fe}} \times 1 \text{ mol Fe}$$

Nov 3 - 8:55 AM

How many Fe^{3+} ions are in 7.92×10^{24} formula units of Fe_2O_3 ?

Given

$$7.92 \times 10^{24} \text{ Form. U. Fe}_2\text{O}_3$$

Wanted
 Fe^{3+} ions

$$\frac{7.92 \times 10^{24} \text{ Form. U. Fe}_2\text{O}_3}{1 \text{ Form. U. of Fe}_2\text{O}_3} \times 2 \text{ Fe}^{3+} \text{ ions}$$

Nov 3 - 8:58 AM