



Honors Chemistry

Monday August 31st 2015

Agenda

- * Warm Up: NONE
- * Start Topic 1.2 The Mole Concept
- * Activity 3: Calculating Stoichiometry Calculations

HOMEWORK

- * **Topic 1.1 Introduction to Particulate Nature of Matter & Chemical Change vocabulary**
- * DUE September 4th 2015
- * **Memorize the first 20 elements of the periodic table**
- * QUIZ September 3rd or 4th 2015

Stoichiometric Relationships

Introduction to the Particulate Nature of Matter and Chemical Change

The Mole Concept

Reacting Masses and Volumes



Ms. Thompson - Honors Chemistry
Wooster High School

Topic 1.2

The Mole Concept

- Define relative atomic mass and relative molecular mass
- Understand what is meant by one mole of a substance
- Calculate the mass of one mole of a substance
- Calculate the number of moles present in a specified mass of a substance
- Work out the number of particles in a specified mass of a substance and also the mass of one mole

The Mole Concept

SI: the international system of measurement

Property	Unit	Symbol
mass	kilogram	kg
temperature	kelvin	K
time	second	s
amount	mole	mol
electric current	ampère	A
luminosity	candela	cd
length	metre	m

The International Bureau of Weights and Measures (BIPM) monitors the correct use of SI units and ensures consistency regardless of where they being used.

Know these!

The Mole Concept

Avogadro's Constant (N_A)

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

Molar volume of an ideal gas at 273K and 100kPa

$$2.27 \times 10^{-2} \text{ m}^3 \text{ mol}^{-1}$$

(=22.7 dm³ mol⁻¹)

Negative indices and units

An **index** or **power** is a mathematical notation that shows that a quantity or physical unit is repeatedly multiplied by itself: $m \times m = m^2$

A **negative index** shows a reciprocal

$$1/x = x^{-1} \quad \text{dm}^{-3} = 1/\text{dm}^3$$

Useful Prefixes

Prefix	Abbreviation	Scale
nano	n	10^{-9}
micro	μ	10^{-6}
milli	m	10^{-3}
centi	c	10^{-2}
deci	d	10^{-1}
standard	-	1
kilo	k	10^3
mega	M	10^6
giga	G	10^9

The Mole Concept

Amount of substance: The mole

- **Stoichiometry** is the study of the ratios in which chemical substances combine
- The ability to measure precise amounts of reacting substances is important!!
- All chemical substances are made up of elements and their constituent atoms which vary in their number of protons, neutrons, and electrons



The Mole Concept

Amount of substance: The mole

- Had to determine a way to measure equal amounts of different elements regardless of how big their atoms are which tells us how much reacting quantities we have
- The **mole** is an SI unit, symbol **mol**, defined as a fixed amount, n , of a substance.
 - This is known as **Avogadro's constant** = $6.02 \times 10^{23} \text{ mol}^{-1}$



Activity 3: Calculating Stoichiometry (pgs S7-10)

- * You will learn about how to determine an amount of an unknown substance by converting units of your known substance
- * This will take THREE days to work through and can get confusing. Be sure you are participating FULLY, asking QUESTIONS when you are not clear on something, and coming in to see me at LUNCH or AFTER school if you need additional help.

HOMEWORK

- * **Topic 1.1 Introduction to Particulate Nature of Matter & Chemical Change vocabulary**
- * DUE September 4th 2015
- * **Balancing Chemical Equations Worksheet**
- * DUE TODAY or August 26th 2015 (if we didn't get to it on Thurs/Fri)