

Name: Key
 Blk: _____ Date: _____

Chemistry 11 THE MOLE + AVOGADRO'S NUMBER

Avogadro's Hypothesis: equal volumes of gases at the same temperature and pressure, will have equal number of "particles" (atoms or molecules)

Avogadro's Number: 6.02×10^{23} of anything

How much is in a mole?

Think of the "mole" as an amount of a substance. There are many terms in the English language that convey certain quantities:

	A	B
1	Couple	2
2	Few	> 3
3	Dozen	12
4	Basketball team	5
5	Gross	144 (12x12)
6	Mole	6.02×10^{23}

We are aware that if you have a dozen cookies they are going to have a different mass than a dozen soccer balls. Similarly a mole of ~~an~~ Silver is going to have a different mass than a mole of Gold. Let's investigate:

	A	B	C	D
1	Element	Atomic Mass	No. of Moles	No. of Atoms
2	Ag	107.9 grams	1 mole	6.02×10^{23}
3	Au	197.0 g	1 mole	6.02×10^{23}
4	Cu	63.5 g	1 mol	6.02×10^{23}
5	Fe	55.8 g	1 mol	6.02×10^{23}

We can use the information in this table to generate some important **CONVERSION FACTORS!!!**

If one mole of Ag = 107.9 grams of Ag, then we have TWO CONVERSION FACTORS:

$$\frac{1 \text{ mol Ag}}{107.9 \text{ g Ag}} \text{ or } \frac{107.9 \text{ g Ag}}{1 \text{ mol Ag}}$$

If one mole of Ag = 6.02×10^{23} atoms of Ag, then we have TWO CONVERSION FACTORS:

$$\frac{1 \text{ mol Ag}}{6.02 \times 10^{23} \text{ atoms Ag}} \text{ or } \frac{6.02 \times 10^{23} \text{ atoms Ag}}{1 \text{ mol Ag}}$$

"All roads must pass through the MOLE, because the mole is the HEART of chemistry."---Mrs.Weiss

The diagram below will become an useful tool to use when solving chemistry problems

