

## MOLE

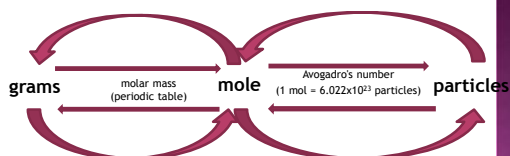
- SI unit for the amount of a substance (mol)
- Counting unit
- Defined as the amount of substance that contains as many elementary things (atoms, molecules, particles) as there are atoms in C-12
- 1 mole contains  $6.022 \times 10^{23}$  particles
  - ex: 1 mole H =  $6.022 \times 10^{23}$  atoms
  - 1 mole Ca =  $6.022 \times 10^{23}$  atoms
  - 1 mole Au =  $6.022 \times 10^{23}$  atoms

## MOLAR MASS

- Molar Mass- mass of one mole of a substance expressed as g/mol

Ex: Hg      200.59g/mol  
 Li        6.94 g/mol

## MOLE CONVERSION FLOW CHART



## GRAM/MOLE/ATOMS CONVERSIONS

- Ex: How many moles of atoms does 245.2 g of zinc metal contain?

- Find the amu of Zn—65.38 amu
- Use the equivalent----
- Use dimensional analysis to solve

$$245.2 \text{ g} \times \frac{1 \text{ mol Zn atoms}}{65.38 \text{ g Zn}} = 3.75 \text{ mol of Zn atoms}$$

- Ex: How many atoms are contained in 0.125 mol of zinc atoms?

- Use the equivalent-----  
 1 mol Zn =  $6.022 \times 10^{23}$  atoms
- Use dimensional analysis to solve

$$0.125 \text{ mol Zn} \times \frac{6.022 \times 10^{23} \text{ atoms}}{1 \text{ mol Zn}} = 7.53 \times 10^{22} \text{ Zn atoms}$$

- Ex: Calculate the mass of one aluminum atom in grams.

- Use the equivalents----
- Use dimensional analysis to solve

$$\frac{1 \text{ Al atom}}{6022 \times 10^{23} \text{ atoms Al}} \times \frac{26.98 \text{ g Al}}{1 \text{ mol Al}} = 4.480 \times 10^{-23} \text{ g Al}$$

Therefore--- mass of 1 Al atom =  $4.480 \times 10^{-23} \text{ g}$