

MOLAR MASS

Determine the molar mass for the following elements:

Ca 40.08 g/mol
 Xe 131.29 g/mol
 Au 196.97 g/mol
 O 16.00 g/mol

Determine the molar mass for the following molecules/compounds

NaCl 58.44 g/mol
 Fe₂O₃ 159.7 g/mol
 Na₂O 61.98 g/mol
 Cl₂ 70.9 g/mol

MOLE AND GRAM CALCULATIONS

Determine the mass of the following samples

2 moles Co → $\frac{2 \text{ moles Co}}{1} \cdot \frac{58.93 \text{ g}}{1 \text{ mole}} = 117.86 \text{ g of Co}$
 5 moles H₂
 2.1 moles H₂O
 7.29 mol CO₂ → $\frac{7.29 \text{ mol CO}_2}{1} \cdot \frac{44.01 \text{ g}}{1 \text{ mole}} = 320.83 \text{ g CO}_2$

Determine the number of moles in the following samples

54.2 g N₂
 202.2 g MgO → $\frac{202.2 \text{ g MgO}}{1} \cdot \frac{1 \text{ mole}}{40.31 \text{ g}} = 5.02 \text{ mole MgO}$
 519.3 g FeCl₃
 712.4 g AuCl → $\frac{519.3 \text{ g FeCl}_3}{1} \cdot \frac{1 \text{ mole}}{162.2 \text{ g}} = 3.2 \text{ mole FeCl}_3$

MOLE CALCULATIONS

Show all your work for the following questions:

How many liters are consumed by 1.4×10^{18} molecules of chlorine gas at STP?

$$\left(\frac{1.4 \times 10^{18} \text{ molecules}}{1} \right) \left(\frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molecules}} \right) \left(\frac{22.4 \text{ L}}{1 \text{ mole}} \right) = 5.21 \times 10^{-5} \text{ L}$$

How many particles are in 178 g of the artificial sweetener saccharin, C₇H₅NO₃S?

$$\left(\frac{178 \text{ g}}{1} \right) \left(\frac{1 \text{ mole}}{183.2 \text{ g}} \right) \left(\frac{6.02 \times 10^{23} \text{ particles}}{1 \text{ mole}} \right) = 5.85 \times 10^{23} \text{ particles}$$

$84.07 + 5.05 + 14.01 + 48 + 32.07 =$

How many molecules are in 2.5×10^3 g of phosphorus tribromide? You need to write out the chemical formula in order to solve!

$$\left(\frac{2.5 \times 10^3 \text{ g}}{1} \right) \left(\frac{1 \text{ mole}}{270.67 \text{ g}} \right) \left(\frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mole}} \right) = 0.056 \times 10^{26}$$

PBr₃

What is the mass of 321 L of fluorine gas at STP?

$$\left(\frac{321 \text{ L F}_2}{1} \right) \left(\frac{1 \text{ mole}}{22.4 \text{ L}} \right) \left(\frac{38 \text{ g}}{1 \text{ mole}} \right) = 544.55 \text{ g F}_2$$

$5.6 \times 10^{24} \text{ molecules}$

TRANSLATING REACTIONS

Write out the following chemical reactions into a chemical equation. Label the reactants and products and balance the reaction.

zinc metal and hydrochloric acid (aqueous) producing zinc chloride (aqueous) and hydrogen gas



aqueous calcium nitrate and aqueous sodium hydroxide producing the precipitate (solid) calcium hydroxide and aqueous sodium nitrate



When dissolved beryllium chloride reacts with dissolved silver nitrate in water, aqueous beryllium nitrate and silver chloride powder are made.

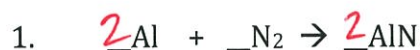


When fluorine gas is put into contact with calcium metal at high temperatures, calcium fluoride powder is created in an exothermic reaction.



BALANCING AND TYPES OF REACTIONS

Balancing and Identify the type of reaction for each of the follow reactions.



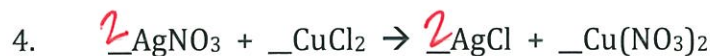
Reaction Type: Synthesis



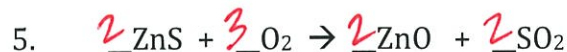
Reaction Type: decomposition



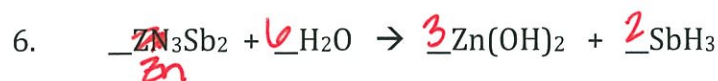
Reaction Type: double replac.



Reaction Type: double replac.



Reaction Type: single/decomp.



Reaction Type: double/decomp.

PREDICT, BALANCE, AND IDENTITY EACH TYPE OF REACTION



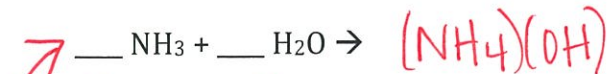
double replac.



combustion



single replac.



synthesis



Super hard!

*won't be that hard on Exam!

Percent Composition by Mass

Find the *percent composition by mass* the **bold atom** and **ONLY the bold atoms** in the following compounds:

1. Ammonium phosphate - **(Hydrogen)**

$$\begin{array}{l} \text{(NH}_4\text{)}_3\text{PO}_4 \\ \frac{12.12\text{g}}{149.12\text{g}} \times 100 = \boxed{8.13\% \text{ H}} \end{array}$$

total = 149.12g

2. Mg(NO₃)₂

3. Potassium permanganate - **(Oxygen)**

$$\begin{array}{l} \text{KMnO}_4 \\ \frac{64\text{g}}{158.04\text{g}} \times 100 = \boxed{40.51.0} \end{array}$$

total = 158.04g

4. **Calcium** chlorite