

Success 24/7 Chemistry: Stoichiometry

What is involved in this unit:

Mole conversions

Balanced chemical equations

Molar mass calculations

Writing names of compounds

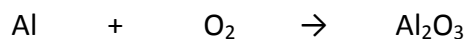
Sig Figs

Dimensional Analysis

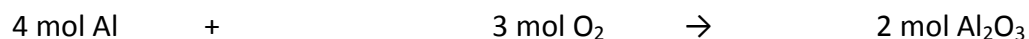
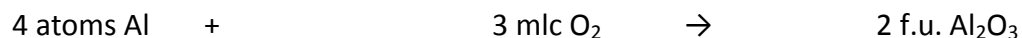
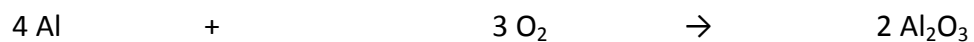
Mole Ratios!

Stoichiometry – study of calculations of quantities in chemical reactions using balanced chemical equations.

Remember: We balance chemical equations to follow the law of conservation of mass.



Once we know the coefficients, we know a few more things.

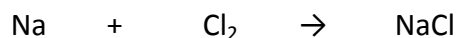


Mole Ratio:

used as conversion factors to predict the amount of any reactant or product involved in a reaction if the amount of another reactant and/or product is known.

To find the mole ratio, use the coefficients from a BALANCED CHEMICAL EQUATION.

Write all the mole ratios for the following equation:



The simple summary of stoich using food:

Basic Turkey Sandwich

3 Slices of Turkey + 1 piece of cheese + 2 pieces of bread → 1 turkey sand

If you want to make 3 sandwiches, how many pieces of bread would you need?

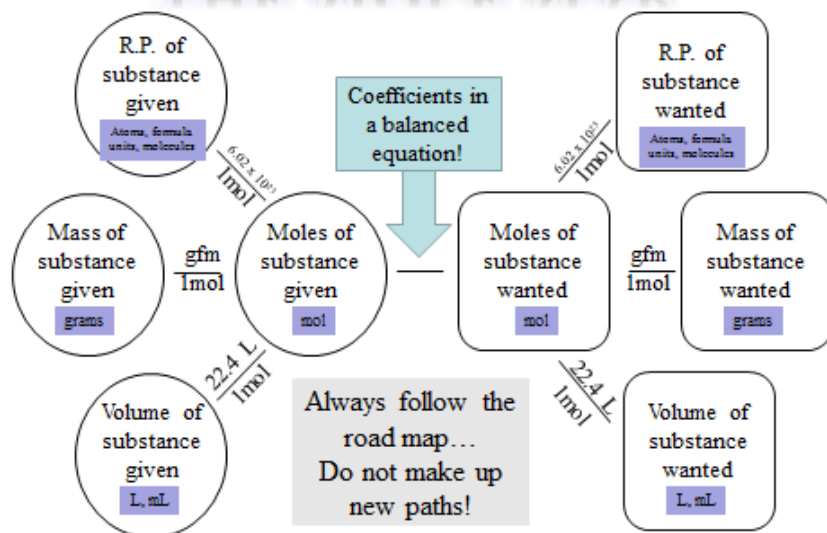
Reminder of the mole conversions:

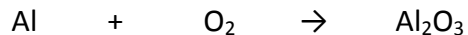
1 mol = 6.02×10^{23} rep. part. (atom, mlc, f.u.)

1 mol = _____ g

1 mol = 22.4 L (of gas at STP)

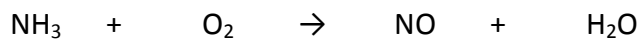
THE MOLE MAP



Mol-Mol Stoich:

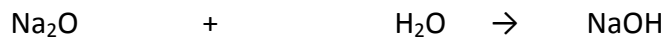
- a. How many moles of aluminum oxide will be formed from 17 moles of aluminum reacting?

- b. How many moles of oxygen are needed to react with 3.4 moles of aluminum?



- a. How many moles of oxygen are needed to react with 3.24 moles of ammonia?

- b. How many moles of water are produced from 12.6 moles of oxygen?

Mol-Mass Stoich:

- a. How many grams of NaOH are produced from 120 mol of Na₂O?

- b. How many moles of Na₂O are required to produce 287 grams of NaOH?

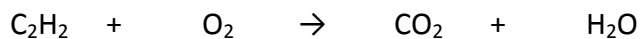


- a. How many grams of Cu are needed to react with 3.50 moles of AgNO_3 ?
- b. If 89.5 grams of Ag were produced, how many moles of Cu reacted?

Mass-Mass Stoich



If you start with 5.5 grams of sodium fluoride, how many grams of magnesium fluoride will be produced?

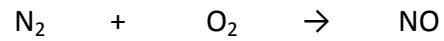


If you start with 45 grams of ethylene (C_2H_4), how many grams of carbon dioxide will be produced?

Combo Mol Stoich:



How many liters of oxygen gas at STP are released from the decomposition of 2.57 g of calcium chlorate?



If 2.3×10^{26} molecules of nitrogen gas react with excess oxygen, how many L of nitrogen monoxide will be produced?