

Stoichiometry

<http://www.unit5.org/chemistry/Stoichiometry.htm>

Learning Objectives/Targets

Worksheet / Lab

STOICHIOMETRY

10.1 INTERPRETING A CHEMICAL EQUATION

- To relate the coefficients in a balanced chemical equation to:
(a) moles of reactants and products
(b) liters of gaseous reactants and products

10.2 MOLE-MOLE RELATIONSHIPS

- To relate the number of moles of two substances in a balanced chemical equation.

10.3 TYPES OF STOICHIOMETRY PROBLEMS

- To classify the three basic types of stoichiometry problems; mass-mass, mass-volume, and volume-volume.
- To state the procedure for solving a stoichiometry problem, given the balanced equation.

10.4 MASS-MASS PROBLEMS

- To perform mass-mass stoichiometry calculations.

10.5 MASS-VOLUME PROBLEMS

- To perform mass-volume stoichiometry calculations.

10.6 VOLUME-VOLUME PROBLEMS

- To perform volume-volume stoichiometry calculations.

10.7 THE LIMITING REACTANT CONCEPT

- To explain the concept of a limiting reactant.
- To identify the limiting reactant in a chemical reaction, given the number of moles of each reactant.

10.8 LIMITING REACTANT PROBLEMS

- To perform mass-mass stoichiometry calculations involving a limiting reactant.
- To perform volume-volume stoichiometry calculations involving a gaseous limiting reactant.

10.9 PERCENT YIELD

- To calculate the percent yield for a reaction, given the actual yield and theoretical yield.

BACKGROUND INFORMATION

9.1 Avogadro's Number

- To state the value of Avogadro's number: 6.02×10^{23} .
- To state the mass of Avogadro's number of atoms for any element by referring to the periodic table.

9.2 Mole Calculations I

- To relate the moles of a substance to the number of particles.

9.3 Molar Mass

- To calculate the molar mass of a substance, given its chemical formula.

9.4 Mole Calculations II

- To relate the mass of a substance to the number of particles.

9.5 Molar Volume

- To state the value for the molar volume of any gas at STP: 22.4 L/mol.
- To relate the density of a gas at STP to its molar mass and volume.

9.6 Mole Calculations III

- To relate the volume of a gas at STP to its mass and number of particles.