What is Stoichiometry?

Worksheet

Stoichiometry uses mole ratios from a balanced equation to predict how much product forms or how much reactant is needed. For example, in 2H + O 2HO, 2 moles of H react with 1 mole of O to make 2 moles of water.

Questions

1. In 3O 2O, if 6 moles of O react, how many moles of O form?

A) 2 mol
B) 4 mol
C) 6 mol
D) 9 mol

2. To find moles from mass, you use

A) moles = mass M
B) moles = mass / M
C) moles = M / mass
D) M = moles mass

3. In a reaction, stoichiometric coefficients represent

A) mass ratios
B) volume ratios (at STP)
C) mole ratios
D) density ratios

4. If the equation 2A + B 2C, and 3 mol of A reacts, B required is

A) 3 mol
B) 2 mol
C) 1.5 mol
D) 6 mol

5. In the reaction 2H + O 2HO, if 4 moles of H react with O, how many moles of HO are produced?

6. Given the reaction C + O CO, how many grams of O are needed to burn 12 g of carbon (C, M=12 g/mol)?

7. In the reaction 2NH N + 3H, if 6 moles of NH decompose, how many moles of H form?

8. Define: What is stoichiometry?

9. Define: Why must equations be balanced?

10. Define: What is a mole ratio?

Answer Key

1. B) 4 mol - Mole ratio 3:2. 6 mol O (2 mol O/3 mol O) = 4 mol O.

2. B) moles = mass / M - n = m / M (molar mass formula).

3. C) mole ratios - Coefficients in a balanced equation show mole ratios.

4. C) 1.5 mol - Mole ratio A:B = 2:1. 3 mol A (1 mol B/2 mol A) = 1.5 mol B.

5. From the equation: 2 mol H 2 mol HO (1:1 ratio) 4 mol H (2 mol HO / 2 mol H) = 4 mol HO

6. Moles of C = 12 g / 12 g/mol = 1 mol Mole ratio: 1 mol C : 1 mol O 1 mol C (1 mol O / 1 mol C) = 1 mol O Mass O = 1 mol 32 g/mol = 32 g

7. Mole ratio: 2 mol NH 3 mol H 6 mol NH (3 mol H / 2 mol NH) = 9 mol H

8. The quantitative study of chemical reactions - how reactants and products relate to each other by number and mass.

9. To show the correct mole ratios of reactants and products - atoms are conserved.

10. The ratio of moles of one substance to moles of another, derived from the coefficients of a balanced equation.