Gas Volumes in Balanced Reactions Worksheet

Scoring guide · one credit per question · review written work against each rubric

Gas Volumes in Balanced Reactions

Question 1

Choice (1)

Equal conditions give the same volume per mole for all gases in the ideal model.

Question 2

The ratio is 2 volumes CO_2 per 2 volumes CO, so 8.0 L CO gives 8.0 L CO_2.

Question 3

Choice (4)

The coefficients require 3 volumes of H_2 per volume of N_2 at common conditions.

Question 4

Gas volume depends on pressure. The mole ratio still follows the equation, but volumes must be adjusted to common conditions before comparing them.

A Model of Gas Consumption

Question 5

Choice (3)

Use 2 volumes NH_3 per 3 volumes H_2. The yield is 6.0 L × 2/3 = 4.0 L.

Question 6

One volume N_2 reacts per three volumes H_2. Q consumes 9.0 L × 1/3 = 3.0 L N_2.

Question 7

Choice (3)

R starts with twice as much limiting H_2, so its theoretical product volume is twice as large.

Question 8

N_2 is in excess, so the supplied H_2 controls the maximum product. Use the H_2-to-NH_3 ratio and the common temperature and pressure.