

Partial Pressures

Chemistry

Dalton's law, mole fractions, and calculating Kp.

The partial pressure of a gas is its mole fraction multiplied by the total pressure.

$$p(A) = x(A) \times P \text{ total} \quad \cdot \quad x(A) = n(A) \div n \text{ total}$$

2 mol A, 3 mol B, 5 atm total $p(A) = 2 \text{ atm}, p(B) = 3 \text{ atm}$

Sum of partial pressures

Dalton's law.

Equals total pressure

Kp for $N_2 + 3H_2 \rightleftharpoons 2NH_3$

$$p(NH_3)^2 \div (p(N_2) \times p(H_2)^3)$$

THE COMMON MISTAKE

✗ **Using initial moles in the Kp expression**

✓ **Using equilibrium moles**

An ICE table is needed: initial, change, equilibrium. Only the last row goes into the expression.

Set up an ICE table for every equilibrium calculation. Skipping it is where most marks are lost.