CHM 241 (14410)
Excercise

1.11. An ideal gas occupies a volume of 0.300 dm^3 at a pressure of 1.80×10^5 Pa. What is the new volume of the gas maintained at the same temperature if the pressure is reduced to 1.15×10^5 Pa?

Solution:

Given: Ideal Gas: $V_1 = 0.300\ dm^3$, $P_1 = 1.80 \times 10^5$ Pa

Required: V_2

1.12. If the gas in Problem 1.11 were initially at 330 K, what will be the final volume if the temperature were raised to 550 K at constant pressure?

Solution:

Given: same gas as in problem 1.11: $V_1 = 0.300\ dm^3$

$T_1 = 330$ K, $T_2 = 550$ K (constant pressure)

Required: V_2

1.16. A gas that behaves ideally has a density of 1.92 g dm^{-3} at 150 kPa and 298 K. What is the molar mass of the sample?

Solution:

Given: Ideal Gas: $\rho = 1.92$ g dm^{-3}, $P = 150$ kPa, $T = 298$ K

Required: M_{sample}

1.17. The density of air at 101.325 kPa and 298.15 K is 1.159 g dm^{-3}. Assuming that air behaves as an ideal gas, calculate its molar mass.

Solution:

Given: Air: $\rho = 1.159$ g dm^{-3}, $T = 298.15$ K, $P = 101.325$ kPa

Required: M_{air}