

CHM 1033 Fall 2006

Worked Example

Calculate the molar mass of a gas if 0.100 g of the gas occupies a volume of 100 mL at a pressure of 1.00 atm and a temperature of 273 K.

Strategy: We are given the mass of the gas, the volume, the pressure, and the temperature. We can use the ideal gas law to calculate the number of moles of gas. Then we can use the mass and the number of moles to calculate the molar mass.

Given: 0.100 g of gas, 100 mL, 1.00 atm, 273 K

Find: Molar mass of the gas



Solution: We can use the ideal gas law to calculate the number of moles of gas. The ideal gas law is $PV = nRT$. We can rearrange this equation to solve for n : $n = \frac{PV}{RT}$. We can then use the mass and the number of moles to calculate the molar mass: $M = \frac{m}{n}$.

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