

Example of work for Ideal Gas Problems

What is the volume (L) of a balloon that contains 2.05 moles of a gas that is @ 452 mmHg and 21°C
(1 condition problem - Ideal gas)

$$P = 452 \text{ mmHg} \left(\frac{1 \text{ atm}}{760. \text{ mmHg}} \right) = 0.595 \text{ atm}$$

$$T = 21^\circ\text{C} + 273 = 294 \text{ K}$$

$$n = 2.05 \text{ mole}$$

$$R = 0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mole} \cdot \text{K}}$$

$$PV = nRT \quad \Rightarrow \quad V = \frac{nRT}{P}$$

$$V = \frac{(2.05 \text{ mole}) \left(\frac{0.0821 \text{ L} \cdot \text{atm}}{\text{mole} \cdot \text{K}} \right) (294 \text{ K})}{0.595 \text{ atm}}$$

$$V = 83.16 \text{ L}$$

$$V = 83.2 \text{ L}$$