

Molar Volume

The volume (L) of 1 mol of an ideal (normal) gas

Ideal gas law

$$P \cdot V = n \cdot R \cdot T$$

$n = \text{mol}$ $R = \text{ideal gas constant}$
 $T = \text{Abs. T (K)} \quad (0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}})$

Calculate Molar Volume ($\frac{V}{n}$)

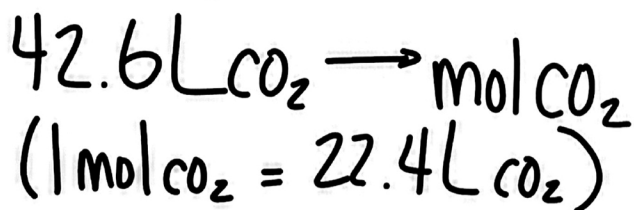
$$\frac{P \cdot V}{P} = \frac{n \cdot R \cdot T}{P}$$

$$\frac{V}{n} = \frac{n \cdot R \cdot T}{P \cdot n}$$

$$\frac{V}{n} = \frac{R \cdot T}{P} = \frac{0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}} \cdot 273 \text{K}}{1 \text{ atm}}$$

Molar Vol. $\frac{V}{n} = 22.4 \text{ L/mol (Molar Vol)}$

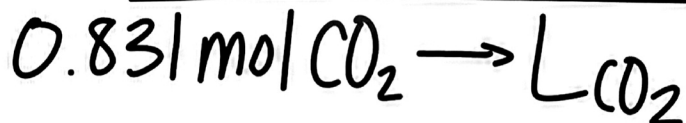
Converting Ideal Gases to and from mol



$$\frac{42.6 \cancel{\text{L CO}_2}}{22.4 \cancel{\text{L CO}_2}} = 1.90 \text{ mol CO}_2$$

Molar Volume

$$1 \text{ mol}_A = 22.4 \text{ L}_A$$



$$\frac{0.831 \cancel{\text{mol CO}_2}}{1 \cancel{\text{mol CO}_2}} \cdot 22.4 \text{ L CO}_2 = 18.6 \text{ L CO}_2$$