Avagadros Hypothesis: Equal volume of gases at the same temperature and pressure have the same number of molecules (moles).

Molar Volume

22.4 Liters/ mole @ STP

$$\frac{1.0\,\ell}{22.4\,\ell/\text{mole}} = .0446\ \text{mole}$$

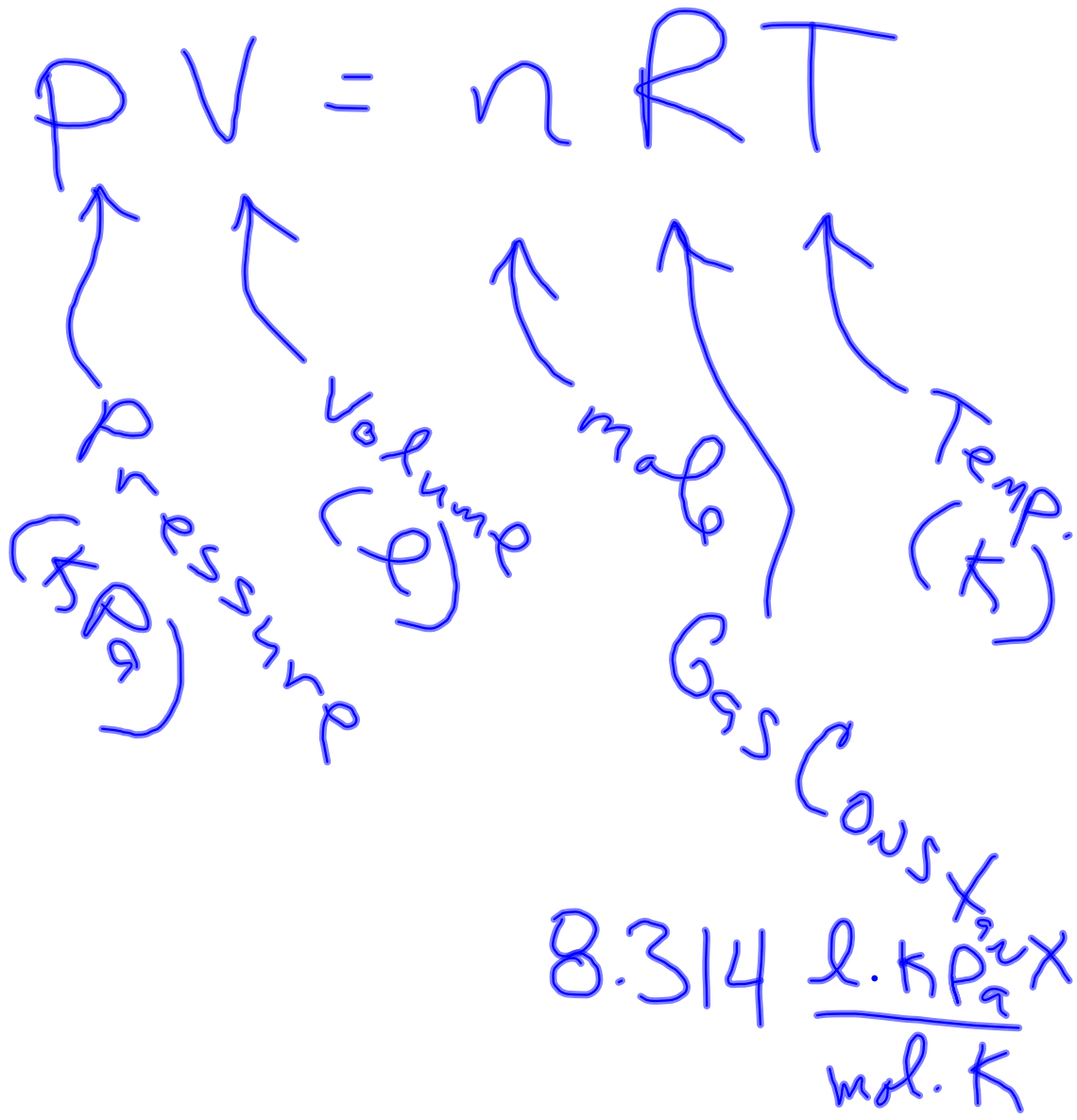
Ideal Gas Law:

1.0 liters of gas at 1.0 atm and 273 K has how many moles.

$n = \frac{PV}{RT} = \frac{(1\,atm)(1.0\,\ell)}{(.0821\,\frac{\ell \cdot atm}{mol \cdot K})(273K)}$ $n = .0446$ mole

What is the mass of the gas if it is Argon?

$$.0446\ \text{mole} \left| \frac{39.95\,g}{\text{mole}} \right. = 1.78\,g$$


PV = nRT
Pressure (kPa)
Volume (L)
mole
Temp. (K)
Gas Constant
8.314 L·kPa / mol·K