

Key Gas Math Summary

STP: Standard Temperature and Pressure

- 0° C (273 K)
- 1 atmosphere (760 mm Hg)
- 1 mole == 22.4 L for an ideal gas at STP

Several Key Conversion Factors When Dealing with Gases

	<u>Conversion Factors</u>	<u>Interconversion Between:</u>
1.	1.0atm = 760 mm Hg	Pressure units
2.	K = 273 + °C	Temperature units
3.	x moles = $\frac{\text{actual mass}}{\text{known molar mass}}$	Mass/mole interconversions
4.	1 mole = 22.4 L at STP	mole/volume interconversions at STP

The Ideal Gas Law	PV = nRT			
Rearranged Versions	$V = \frac{nRT}{P}$	$P = \frac{nRT}{V}$	$n = \frac{PV}{RT}$	$T = \frac{PV}{nR}$

P = Pressure (atm) V = Volume (L) n = moles R = gas constant = 0.0821 atm•L/mol•K T = Temperature (Kelvin)	The correct units are essential. Be sure to convert whatever units you start with into the appropriate units when using the ideal gas law.
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R = 0.0821 atm•L/mol•K

Density = g/L

Basic Gas Laws:

$V \propto 1/P$	or	PV = constant	Boyle's Law
$V \propto T$	or	V/T = constant	Charles's Law
$V \propto n$	or	V/n = constant	Avogadro's Law
$V \propto T/P$	or	PV/T = constant	Combined Law