

GAS LAWS REFERENCE SHEET

LAW	VARIABLE CONSTANCY REQUIREMENT	MATHEMATICAL FORM OF THE LAW
COMBINED GAS LAW	NONE	$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$
BOYLE'S LAW	$T_1 = T_2$	$P_1 V_1 = P_2 V_2$
CHARLES' LAW	$P_1 = P_2$	$\frac{V_1}{T_1} = \frac{V_2}{T_2}$
GAY-LUSSAC'S LAW	$V_1 = V_2$	$\frac{P_1}{T_1} = \frac{P_2}{T_2}$
IDEAL GAS LAW	NONE	$PV = nRT$

UNITS OF PRESSURE EQUALITIES

760 mm Hg = 760 torr = 1 atm = 1.013×10^5 Pascals = 101.3 kPa = 14.68 psi

TEMPERATURE CONVERSIONS

K = °C + 273	°C = 5/9 (°F - 32)
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STANDARD TEMPERATURE AND PRESSURE (STP)

Pressure = 1 atmosphere = 101.3 Kpa Volume = 22.4 Liters Temperature = 273 K n = 1 mole

UNITS OF R Constant

Recall that R can be calculated by using all unit values at STP = $\frac{\text{Pressure} \bullet \text{Volume}}{\text{Mole} \bullet \text{Temperature}}$

If Pressure is in units of kPa then: $R = \frac{8.31 \text{ kPa} \bullet \text{L}}{\text{mole} \bullet \text{K}}$	If Pressure is in units of atmospheres then: $R = \frac{0.0821 \text{ atm} \bullet \text{L}}{\text{mole} \bullet \text{K}}$
If Pressure is in units of mm Hg then: $R = \frac{62.4 \text{ mm Hg} \bullet \text{L}}{\text{mole} \bullet \text{K}}$	If Pressure is in units of torr then: $R = \frac{62.4 \text{ torr} \bullet \text{L}}{\text{mole} \bullet \text{K}}$