CHEM 150: Ch. 10 Ideal Gas Law

What is the Ideal Gas Law?

Explains how the volume of a gas is affected by changes in pressure (P), temperature (T), and amount of moles (n) as described in the equation PV = nRT where R is a gas constant and is the same value for all gases depending on units of the other quantities. Generally,

P = pressure in units of atmosphere (atm)

V = volume in units of liter (L)

n = number of substance in units of moles (mol)

R = 0.082058 $\frac{L \cdot atm}{K \cdot mol}$

T = temperature in units of Kelvin (K)

Within the ideal gas law other gas laws are present

If R is a gas constant in PV = nRT then we can get,

a. Boyle's Law: when n and T are constant

   V = $\frac{nRT}{P}$(constant n and T) = V is proportional to $\frac{1}{P}$

b. Charles's Law: when n and P are constant

   V = $\frac{nRT}{P}$(constant n and P) = V is proportional to T

c. Avogadro's Law: when P and T are constant

   V = $\frac{nRT}{P}$(constant P and T) = V is proportional to n

Therefore, these three laws make up the ideal gas law.