Boyle's Law Encyclopedia Article

Boyle's Law

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Boyle's Law

Boyle's law is one of the **gas laws**. It states that at constant **temperature**, the **volume** of a fixed **mass** of gas is inversely proportional to the pressure. The other way of expressing this law is pV = constant, where p is the pressure and V is the volume of the gas. It is named after British physicist and chemist **Robert Boyle** (1627- 1691).

Boyle's law is sometimes known as the constant temperature law. It can be combined with Charles' law and the pressure law to give the ideal gas law (also known as the universal gas law), pV = nRT, where p is pressure, V is volume, n is the number of moles of gas, R is the universal gas constant, and T is temperature.

Boyle's law is an approximation and works perfectly only for an ideal(theoretical) gas. In practice it works best at low pressures but once the pressures become high the predictions become less accurate. This inaccuracy is due to the size of the gas molecules and weak **intermolecular forces**, such as **van der Waals forces**. At high pressures the molecules are forced together whereas at low pressures the molecules are free to move with very little interaction from neighboring molecules.

Boyle's law is a good indicator of how a gas will react if the temperature is kept constant and the pressure and volume are altered.