Charles' Law Encyclopedia Article

Charles' Law

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Charles' Law

One of the **gas laws**, Charles' law states that at a constant pressure the **volume** of a fixed **mass** of gas is directly proportional to the absolute **temperature**. This law also can be expressed by the equation V/T = constant where V is the volume of the gas and T is the temperature in Kelvin.

Charles' law also is known as Gay-Lussac's law and the constant pressure law. This law was discovered independently by French physicist **Jacques Charles** (1746-1823) in 1787 (who did not publish his findings) and French chemist Joseph Gay- Lussac (1778-1850) in 1802. Although Gay-Lussac was the first scientist to announce this law, it is commonly known as Charles' law for its earlier discoverer. Charles' law can be combined with **Boyle's 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.

Charles' law is one of the ways in which absolute zero is calculated. This is done by extrapolating a graph of volume against temperature. At the point on the graph where the volume of the gas is zero (gas cannot have a volume less than zero), the theoretical temperature is absolute zero, the coldest temperature possible. This point has never actually been achieved, since **gases** liquefy before they reach this temperature and they are no longer subject to the gas laws.

Charles' law is a good indicator of what happens to a gas, since the volume and temperature are altered while the pressure remains constant.