

Ideal gas law

Equation of state

a thermodynamic equation describing the state of matter under a given set of physical conditions. It is a constitutive equation which provides a mathematical relationship between two or more state functions associated with the matter, such as its temperature, pressure, volume is a relation between state variables. More specifically, an equation of state is a thermodynamic equation describing the state of matter under a given set of physical conditions. It is a constitutive equation which provides a mathematical relationship between two or more state functions associated with the matter, such as its temperature, pressure, volume, or internal

gases behave qualitatively like an ideal gas. Many such as nitrogen, oxygen, [hydrogen](#) At normal conditions such as standard temperature and pressure, most real gases behave qualitatively like an ideal gas. Many such as nitrogen, oxygen, hydrogen, [noble gases](#) At normal conditions such as standard temperature and pressure, most real gases behave qualitatively like an ideal gas. Many such as nitrogen, oxygen, hydrogen, noble gases, and some heavier gases like [carbon dioxide](#) At normal conditions such as standard temperature and pressure, most real gases behave qualitatively like an ideal gas. Many such as nitrogen, oxygen, hydrogen, noble gases, and some heavier gases like carbon dioxide can be treated like ideal gases within reasonable tolerances. Generally, a gas behaves more like an ideal gas at higher [temperature](#) At normal conditions such as standard temperature and pressure, most real gases behave qualitatively like an ideal gas. Many such as nitrogen, oxygen, hydrogen, noble gases, and some heavier gases like carbon dioxide can be treated like ideal gases within reasonable tolerances. Generally, a gas behaves more like an ideal gas at higher temperature and lower [pressure](#) At normal conditions such as standard temperature and pressure, most real gases behave qualitatively like an ideal gas. Many such as nitrogen, oxygen, hydrogen, noble gases, and some heavier gases like carbon dioxide can be treated like ideal gases within reasonable tolerances. Generally, a gas behaves more like an ideal gas at higher temperature and lower pressure, as the [work](#) At normal conditions such as standard temperature and pressure, most real gases behave qualitatively like an ideal gas. Many

The classical ideal gas law may be written:

$$PV = RT$$

$$PV = nRT$$

An **isothermal process** is a change of a *system*, in which the temperature remains constant: $\Delta T = 0$. This typically occurs when a system is in contact with an outside thermal reservoir (heat bath = 0). This typically occurs when a system is in contact with an outside thermal reservoir (heat bath), and the change occurs slowly enough to allow the system to continually adjust to the temperature of the reservoir through heat exchange. In contrast, an adiabatic process is where a system exchanges no heat with its surroundings ($Q = 0$). In other words, in an isothermal process, the value $\Delta T = 0$ and therefore $\Delta U = 0$ (only for

An *isobaric process* is a [thermodynamic process](#) in which the pressure stays constant: $\Delta P = 0$. The term derives from the Greek *iso-* (equal) and *baros* (weight). The heat transferred to the system does work, but also changes the internal energy of the system:

An **isochoric process**, also called a **constant-volume process**, is a [thermodynamic process](#), is a thermodynamic process during which the [volume](#), is a thermodynamic process during which the volume of the [closed system](#) undergoing such a process remains constant. An isochoric process is exemplified by the heating or the cooling of the contents of a sealed, inelastic container:

a **partial pressure** which is the hypothetical **pressure** of that gas if it alone occupied the **volume** is the hypothetical pressure of that gas if it alone occupied the volume of the mixture at the same **temperature** is the hypothetical pressure of that gas if it alone occupied the volume of the mixture at the same temperature. The total pressure of an **ideal gas** mixture is the sum of the partial pressures of each individual gas in the mixture as stated by **Dalton's law**

$$P = P_1 + P_2 + \dots + P_n = \sum_{i=1}^n P_i$$

Partial volume

The partial volume of a particular gas in a mixture is the volume of one component of the gas mixture. It is useful in gas mixtures, e.g. air, to focus on one particular gas component, e.g. oxygen.

It can be approximated both from partial pressure and molar fraction

$$V_1 + V_2 + \dots + V_n = \sum_{i=1}^n V_i$$