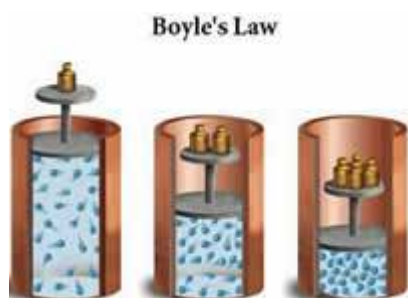


# Gaseous State And Gas Laws

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## Gaseous State

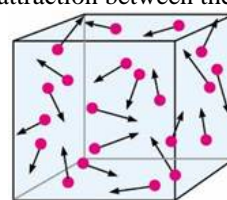
The gaseous state is the simplest of the three [states of matter](#). Only 11 elements in the periodic table are in gaseous state at normal temperature and pressure.



The elements are Hydrogen, Helium, Nitrogen, Oxygen, Fluorine, Neon, Chlorine, Argon, Krypton, Xenon and Radon.

In gaseous state, the [thermal energy](#) of the molecules exceeds the intermolecular attraction between the molecules due to which

[intermolecular forces](#) are not able to bind the molecules together and they show



random movement at a

very high speed.

As the gas occupies the complete space available to it therefore they do not have fixed [volume](#). This feature of gaseous state results uniformity in behavior.

## Properties of gases

The characteristic [physical properties](#) of gaseous state that distinguish it from other state of matter are:



## No Fixed Shape or Volume

In gaseous state the [kinetic energy](#) of molecule is greater than the intermolecular forces of molecules therefore they do not have fixed shape.

So they acquire the shape and volume of the container in which they are kept.

## Gases Are Highly Compressible

As the distance between the molecules in gaseous state is very high therefore it can be compressed by applying higher pressure than the pressure of the gas. On applying high pressure, the volume of the gas decreases.

## Gases Exert Pressure in All Directions

Because of random motion of molecules, the molecules strike together and get bounced back to the walls of container. As the moving molecules possess kinetic energy, so they strike the wall of container with greater and equal force from all directions. So gases exert equal pressure in all directions.

## Gases Have Low Density

Gases have very low [density](#) as compared to [solids](#) and liquids because in gaseous state the atoms or molecules have very high thermal energy and weak intermolecular forces. Due to high thermal energy the molecules move with high kinetic energy and they do not want to remain bound to each other. They maintain maximum distance between each other. Therefore only few of them occupy the lot of space which means that gases have low density.

## Gases Expand On Heating

With the increase in temperature the atoms or molecules have increased thermal energy. Due to this the molecules travels faster and bounce back with a greater speed. Therefore gases expand more on heating as compared to solids and [liquids](#).

## Gases Are Uniformly Distributed

Gases are distributed evenly and completely in all proportions. Example: Air is a mixture of gases in which each gas is uniformly distributed throughout the atmosphere.

# Gas Laws

These properties of the gases are due to negligible intermolecular forces of attraction between them. The behavior of gases is given by certain laws called as Gas laws. Gas law gives quantitative relationship between temperature, pressure, [volume](#) and mass. The characteristics of state of matter are described by these four measurable properties. There are four Gas laws, which show the inter dependence of these measurable properties.

The laws are:

- Boyle's Law
- Charles Law
- Gay Lussac's Law
- Avogadro Law

## How are molecules of liquid and gas different from each other?

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### Reference Links:

- [http://en.wikipedia.org/wiki/State\\_of\\_matter](http://en.wikipedia.org/wiki/State_of_matter)
- <http://www.chemguide.co.uk/atoms/bonding/vdw.html>
- <http://www.elmhurst.edu/~chm/vchembook/104Aphysprop.html>
- [http://martine.people.cofc.edu/111LectWeek1\\_files/image008.jpg](http://martine.people.cofc.edu/111LectWeek1_files/image008.jpg)
- [http://t1.gstatic.com/images?q=tbn:ANd9GcTk6s8wA-cpb97R3kR2mma5Fr57XnsE9DF1a\\_Sc9GzeFeMzr-Cf](http://t1.gstatic.com/images?q=tbn:ANd9GcTk6s8wA-cpb97R3kR2mma5Fr57XnsE9DF1a_Sc9GzeFeMzr-Cf)

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