Ideal gasses and thermal attributes

Kinetic molecular theory

All matter are made up of particles.

1) Particles are moving E_k
2) There are empty spaces between particles.
3) There are attraction and repulsion forces between particles.
4) Particles constantly collide, elastically. They also collide against the walls of the container.
5) On a given time the speed and velocity of a particle differs.

Average E_k stays constant as long as the temperature stays constant.

It explains why gasses:

1) Is compressible
2) Fills the entire container
3) Diffusion
4) Brownian motion

Ideal gas model:

Hypothetical gas that obeys the gas laws at all time and under all conditions of pressure and temperature.

Attributes:

1) Identical particles.
2) Would take up volume due to the movement of particles.
3) No attraction or repulsion forces.
4) Collisions is completely elastic.

Standard temperature and pressure

Temperature: $0℃/273k$

Pressure: $101{,}3\ kPa/1{,}013 \times 10^{5Pa}$

Pressure

Amount of collisions of the gas per surface unit in a determined time against the walls of the container.

$$\boldsymbol{P}\ (druk\ pa) = \frac{\boldsymbol{F}\ (N)}{\boldsymbol{A}\ (opp.\ in\ m^3)}$$

Value of the volume reaches a minimum and no volume of any gas would be able to decrease below this value.

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True gasses:

Diverge due to: 1) low temperature

2) high pressure

Explanation:

Low temperature

1) E_k ↓∴ particles moves slower

2) Causes amount of collisions to ↓

3) Pressure ↓

4) Particles close to each other (does not repulse one another).

5) Attraction force can ↑ until condensation.

High pressure:

1) The volume of gas particles contributes to T & V_T

∴ greater volume

2) Larger particles ↑ attraction forces and

∴ ↓ volume taken up (particles attracts one another).

3) Liquefying takes place under high kinetic pressure.

$He + H$ acts the closest to ideal gasses.