

Sem-11
Paper-2
Concept of ideal gas

Following are the Condition of ideal gas.

- (i) There should not be any force of attraction or repulsion.
- (ii) It does not occupy space. i.e. It has negligible volume.
- (iii) It occurs at high temperature and low pressure.
- (iv) For ideal gas change in enthalpy and free energy should be zero.
i.e. $\Delta H = 0$, $\Delta G = 0$

(v) It should obey Boyle's, Charles and Avagadro's Law.

i.e. $V \propto \frac{1}{P}$ — (i) (Boyle's Law)

$V \propto T$ — (ii) (Charles Law)

$V \propto n$ — (iii) (Avagadro's Law)

Combining (i), (ii) and (iii) we get.

$$V \propto \frac{nT}{P}$$

or $\boxed{V = \frac{RnT}{P}}$ where R is a Proportionality Constant.

Known as Universal Gas Constant.

So, $\boxed{PV = nRT}$ This is the required expression for ideal gas known as ideal gas equation.

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