

Vanderwaal Equation of state for real gases:—

Vanderwaal modified the ideal gas equation $PV = nRT$ by introducing two correction terms, one for the volume and the other for the pressure, to make the equation applicable for real gases.

Vanderwaal substituting the value of V we get— $V_i = (V - nb)$

Similarly he corrected pressure by adding $\frac{an^2}{V^2}$

$$P_i = P + \frac{an^2}{V^2}$$

Where n = Number of moles of real gas

V = volume of gas

a = constant

b = constant

The modified equation is —

$$\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$$

where a & b is vanderwaal constant.