Van der Waals equation of state [tln22]

Atoms of gases interact via short-range force. The ideal gas equation of state, $pV = nRT$, neglects the interaction completely. The van-der Waals equation of state takes it into account summarily:

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

where a, b are empirical parameters.

- nb: excluded volume due to the repulsive core of the interaction at short distances,

- $-an^2/V^2$: pressure correction due to the attractive tail of the interaction at long distances.