The relation between the pressure exerted by an ideal gas (Pideal) and observed pressure (Preal) is given by the equation:

Pideal = Preal+ an2 /V2

If the pressure is taken in Nm-2, the number of moles in mol and volume in m3, Calculate the unit of 'a'. What will be the unit of 'a' when pressure is in atmosphere and volume in dm3?

Solution:

We know Pideal = Preal+ an2 /V2

Pideal – Preal= an2 /V2 Nm-2 = a*mol2/m6 A = Nm4mol-2

The unit of 'a' when the pressure is taken in Nm-2, number of moles in "mol" and volume in m3 is Nm4mol-2

when pressure is in atmosphere and volume in dm3 than, the value of 'a' is: a = atm x mol2 x dm-6