Answer on Question #51208 – Chemistry – Physical Chemistry

Question:

Deduce the SI units for the gas constant, R.

Answer:

In order to derive gas constant, we'll use the equation for ideal gas.

$$PV = nRT,$$

$$R = PV/nT.$$

The pressure, **P**, has units Pa, which are $N*m^{-2}$, and the volume, **V**, has units m^3, **n**, amount of moles, has units mol, **T** is temperature and the units are K. The dimensions of **R** are:

$$N*m^{-2} * m^3 * mol^{-1} * K^{-1} = N * m * mol^{-1} * K^{-1} = J * mol^{-1} * K^{-1}.$$