

The Gas Constant, R , in Various Units

R is the gas constant in the ideal gas equation

$$pV = nRT$$

R is related to the Boltzmann constant, k , by

$$R = k \cdot N_A$$

where $k = 1.3806 \times 10^{-23} \text{ J K}^{-1}$, and $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$

R with different units

8.31451	$\text{J K}^{-1} \text{ mol}^{-1}$
8.20578×10^{-2}	$\text{L atm K}^{-1} \text{ mol}^{-1}$
8.31451×10^{-2}	$\text{L bar K}^{-1} \text{ mol}^{-1}$
8.31451	$\text{Pa m}^3 \text{ K}^{-1} \text{ mol}^{-1}$
62.364	$\text{L Torr K}^{-1} \text{ mol}^{-1}$
1.98722	$\text{cal K}^{-1} \text{ mol}^{-1}$