Answer on Question #46448, Physics, Other

calculate the average translational kinetic energy of a nitrogen molecule at 27 degree celcius

Solution

Kinetic energy of molecules and temperature of gas are related as

$$E_k = \frac{3}{2}kT$$

where T is absolute temperature (here it will be 27+273=300). Hence

$$E_k = \frac{3}{2} \cdot 1.38 \cdot 10^{-23} \cdot 300 = 6.21 \cdot 10^{-21} \, J$$