

**Answer on Question #46447, Physics, Other**

*Calculate the average translational kinetic energy of a nitrogen molecule at 27 degree Celsius*

Average translational kinetic energy of a nitrogen molecule can be found from the equation for two-molecule ( $N_2$ ) system:

$$K = \frac{5}{2} k_B T$$

Where  $k_B$  - is the Boltzmann constant,  $T$  – temperature

$$K = \frac{5}{2} \cdot 1.38 \cdot 10^{-23} \frac{J}{K} \cdot 300K \approx 1.04 \cdot 10^{20} J$$

**Answer:** average translational kinetic energy of a nitrogen molecule is  $K \approx 1.04 \cdot 10^{20} J$