**Answer on Question #73215 - Physics / Molecular Physics**

The average energy of helium is $\bar{E} = 2.89 \times 10^{-21}$ J . Calculate their average speed $v$.

**Solution:**

The average energy

$$\bar{E} = \frac{m\bar{v}^2}{2}$$

The average speed

$$\bar{v} = \sqrt{\frac{2\bar{E}}{m}}$$

The mass of helium atom is

$$m = \frac{\mu}{N_A} = \frac{0.004}{6.02 \times 10^{23}} = 6.64 \times 10^{-27} \text{ kg}$$

Finally

$$\bar{v} = \sqrt{\frac{2 \times 2.89 \times 10^{-21}}{6.64 \times 10^{-27}}} = 933 \frac{\text{m}}{\text{s}}$$

**Answer:** $\bar{v} = 933 \frac{\text{m}}{\text{s}}$.