

Answer on Question #81058, Physics / Astronomy | Astrophysics

Question:

An energy of 5.35eV is stored by a molecule undergoing circulatory motion with an angular momentum of 0.5kgm²s⁻¹, determine its moment of inertia.

Solution:

The energy $W = \frac{J\omega^2}{2}$, the angular momentum $L = J\omega$, respectively $W = \frac{L^2}{2J}$, therefore the moment of inertia $J = \frac{L^2}{2W} = \frac{0.25}{2 \cdot 5.35 \cdot 1.6 \cdot 10^{-19}} = 1.5 \cdot 10^{17}$ (kgm²), what is evidently wrong because the angular momentum isn't correct.

The answer:

The moment of inertia $J = \frac{L^2}{2W} = \frac{0.25}{2 \cdot 5.35 \cdot 1.6 \cdot 10^{-19}} = 1.5 \cdot 10^{17}$ kgm², what is evidently wrong, because the angular momentum (0.5kgm²s⁻¹) isn't correct.

Answer provided by <https://www.AssignmentExpert.com>