Answer on Question #49814 – Physics – Other

Question.

A rotational transition of the carbon monoxide molecule occurs at a frequency of 115.3GHz. Since this is electromagnetic radiation, the wave travels at the speed of light. What is the wavelength, in mm, of this transition?

Given:

$f = 115.3\ GHz = 1.153 \cdot 10^{11}\ Hz$

$c = 3 \cdot 10^{8}\ \frac{m}{s}$

Find:

$\lambda = ?$

Solution.

By definition:

$$\lambda = \frac{c}{f}$$

Calculate:

$$\lambda = \frac{3 \cdot 10^{8}}{1.153 \cdot 10^{11}} = 2.6 \cdot 10^{-3}\ m = 2.6\ mm$$

Answer.

$2.6\ mm$