

Answer on question #62692, Chemistry / General chemistry

The wavelength of green light from a traffic signal is centered at 5.20×10^{-5} cm. (1m = 100 cm)
Calculate the frequency. Rearrange $C = \lambda\nu$ for ν .

Solution:

Speed of light correspond:

$$c = \lambda \cdot \nu = 3 \cdot 10^8 \text{ m/s}$$

The wavelength in m is value in cm divided by 100:

$$\lambda = 5.20 \cdot 10^{-5} \text{ cm} = 5.20 \cdot 10^{-7} \text{ m}$$

The frequency of green light:

$$\nu = \frac{c}{\lambda} = \frac{3 \cdot 10^8 \text{ m/s}}{5.20 \cdot 10^{-7} \text{ m}} = 5.77 \cdot 10^{14} \text{ s}^{-1}$$

Answer: the frequency $\nu = 5.77 \cdot 10^{14} \text{ s}^{-1}$