

Example Of Light Equation Problem

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What is the wavelength (in nm) of a light that has a frequency of 5.34×10^{14} Hz.

By Dimensional Analysis
 * Whenever you are using speed of light constant ($c = 3.00 \times 10^8 \frac{m}{s} = 3.00 \times 10^8 m \cdot Hz$) you must start with material in denominator!!

1. λ (nm)?

2. $5.34 \times 10^{14} Hz$

$3.00 \times 10^8 m \cdot Hz$

$$3. \left(\frac{1}{5.34 \times 10^{14} Hz} \right) (3.00 \times 10^8 m \cdot Hz) \left(\frac{1 \times 10^9 nm}{1 m} \right) = 561.7 nm = 561 nm$$

BY Equation

1. λ (nm)

2. $c = 3.00 \times 10^8 m \cdot Hz$

$f = 5.34 \times 10^{14} Hz$

$$3. \lambda \cdot f = c \Rightarrow \lambda = \frac{c}{f} = \frac{3.00 \times 10^8 m \cdot Hz}{5.34 \times 10^{14} Hz} = 5.617 \times 10^{-7} m \left(\frac{1 \times 10^9 nm}{1 m} \right) =$$

$= 561.7 nm$

$= 561 nm$

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Last edited October 3, 2013 4:07 pm (diff)

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