Answer on Question#51551 - Chemistry, Other

Task: what is the frequency of light having a wavelength of 691 nm? what is the wavelength(in nm) of radiation having a frequency of 4.29*10^9 Hz? (the radiation is in the microwave region)

a) frequency of light?

.....*10^... Hz

b) Wavelength of radiation?

.....*10^.... nm

Solution:

1. Use the formula:

$$\lambda = \frac{C}{F}$$

λ – Wavelength (m), C – wave speed (m/s), F – frequency (Hz)

a) Change the formula and substitute values (C=$3 \cdot 10^8$ m/s – speed of light):

$$F = \frac{C}{\lambda} = \frac{3 \cdot 10^8}{691 \times 10^{-9}} = 4{,}34 \times 10^{14} Hz$$

b) Only substitute values:

$$\lambda = \frac{C}{F} = \frac{3 \cdot 10^8}{4{,}29 \times 10^9} = 0{,}0699 = 699 \cdot 10^5\ nm$$

Answer:

a) frequency of light?

$$4{,}34 \times 10^{14} Hz$$

b) Wavelength of radiation?

$$699 \cdot 10^5\ nm$$