

Pre-AP Chemistry
Unit #4—Periodicity

Wavelengths, Frequency, Quantum Energy

$$c = \lambda\nu$$
$$E = h\nu$$
$$c = 3.00 \times 10^8 \text{ m/s}$$
$$h = 6.626 \times 10^{-34} \text{ J/Hz}$$
$$1 \text{ m} = 1,000,000 \text{ nm}$$

1. A certain photon of light has a wavelength of 422 nm. What is the frequency of the light?
2. What is the energy of a quantum of light from Question #1?
3. What is the energy of a quantum of light with a frequency of 7.39×10^{14} Hz?
4. What is the wavelength of the quantum of light in Question #4?
5. A certain blue light has a frequency of 6.91×10^{14} Hz. What is the wavelength of the light?
6. A certain red light has a wavelength of 680 nm. What is the frequency of the light?
7. The energy for a quantum of light is 2.84×10^{-19} J. What is the wavelength of this light?

Au	267.7 nm
Ag	328.1 nm
Ba	455.4 nm
Cu	324.8 nm
Na	589.6 nm
Ni	341.5 nm
K	404.7 nm

8. For the following elements and their wavelengths:
 - A. Calculate the frequency for each element.
 - B. Calculate quantum energy for each element.

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