Name _____ Period _____

Electromagnetic Spectrum Worksheet #2

1. Calculate the wavelength of the electromagnetic radiation whose frequency is 7.5×10^{12} Hz.

2. Determine the frequency of light with a wavelength of 4.2×10^{-7} cm. (Watch your units!)

3. Determine the energy (in joules) of a photon whose frequency is 3.55×10^{17} Hz.

4. What is the frequency of a radio wave with an energy of 1.55×10^{-24} J/photon?

5. When sodium is heated, a yellow spectral line whose energy is 3.37×10^{-19} J/photon is produced.
   a. What is the frequency of this light?

   b. What is its wavelength?

6. Cobalt-60 is an artificial radioisotope that is produced in a nuclear reactor for use as a gamma-ray source in the treatment of certain types of cancer. If the wavelength of the gamma radiation from a cobalt-60 source is 1.00×10^{-3} nm, determine its energy in joules/photon.

7. Derive an equation expressing E in terms of h, c, and λ, using the following two equations:

$$\mathbf{E = h}\nu \quad \text{and} \quad \mathbf{c =} \lambda\nu$$