Name: _____ Period: ____

Light Energy Problem Set. SHOW ALL CALCULATIONS AND PUT THE ANSWER IN THE SPACE PROVIDED. ALL RULES FOR SIG FIGS AND ROUNDING APPLY. **DON'T FORGET THE BACK OF ALL SHEETS!!!!!**

1. Carbon dioxide (CO_2) in the atmosphere acts as a greenhouse gas by absorbing infrared radiation at a wavelength of 19 μm.

   a. What is the frequency of this radiation (Hz)?

   _____

   b. What is the energy of a single photon of this radiation (J)?

   _____

   c. What is the energy of a mole of photons at this wavelength (J $mole^{-1}$)?

   _____

2. Ozone (O_3) in the stratosphere filters out ultraviolet radiation by absorbing light at a wavelength of 275 nm.

a. What is the frequency of this radiation (Hz)?

_____

b. What is the energy of a single photon of this radiation (J)?

_____

c. What is the energy of a mole of photons at this wavelength (J $mole^{-1}$)?

_____

3. Excited sodium atoms may emit radiation having a wavelength of 650 nm.

a. What is the wavelength in meters?

_____

b. What is the frequency of this light?

_____

c. What region of the spectrum is this in?

_____

d. What is the energy of this light?

_____

4. A radio station has a frequency of 96.5 MHz. Find the wavelength and E.

_____

_____

5. What is the energy associated with 700 nm light? What color light is this?

_____

_____

6. A certain photon of radiation has energy of 5.55×10^{-15} J. What is the wavelength of this light, in nm?

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