

**General Chemistry II**  
**Chapter 1, Part 1 Example Problems**

1. As I mentioned at the end of class Wednesday, the photoelectric effect is commonly used in chemical analysis. By measuring the current of the “photoelectrons,” detectors can determine the intensity of light either absorbed or emitted by a chemical sample. For accurate measurements, the photoelectrons often need to have a speed of at least  $2.00 \times 10^6 \text{ m s}^{-1}$ .

The electron source in a certain detector is tungsten, which has a work function of  $7.29 \times 10^{-19} \text{ J particle}^{-1}$ . What is the smallest wavenumber of light (in  $\text{cm}^{-1}$ ) we should shine on the tungsten in order to make an accurate measurement of light intensity?

2. (a) Calculate (to three significant figures) the wavelength (in nm) of light emitted when  $\text{He}^+$  undergoes a transition from the  $n = 6$  to the  $n = 4$  state. (b) Calculate (in kJ) the light energy released when 0.200 mol of  $\text{He}^+$  undergoes the transition in part (a).