

**General Chemistry I**  
**Chapter 7 Example Problems**

1. Alarm systems employ the photoelectric effect. Typically, a light beam is aimed at a sample of Na, producing a photoelectric current. An intruder blocks the beam, thereby turning off the current, and triggering the alarm. Given that the work function of Na is  $4.41 \times 10^{-19} \text{ J particle}^{-1}$ , what is the longest wavelength of light (in nm) that can be used in the alarm system?

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).