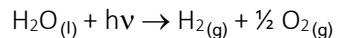


## Practice Exam for Exam 3

1. Photodissociation of water



has been suggested as a source of hydrogen. The  $\Delta H_{\text{rxn}}^\circ$  for the reaction, calculated from thermochemical data, is +285.8 kJ/mol water. Calculate the *wavelength, in nm*, that would be required to effect this reaction.

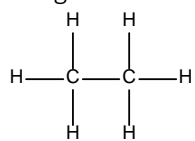
2. A compound of tin and chlorine is a colorless liquid. The vapor has a density of 7.49 g/L at 151°C and 1.00 atm. What is the *molecular weight* of the compound? *Why* do you think the compound is molecular and not ionic? Write the *Lewis formula* for the compound.

3. For the following molecules (a) draw the *Lewis Structure*, (b) give the *electron pair geometry*, (c) give the *molecular geometry*, (d) state whether or not it is *polar*, and (e) give the *hybridization on the central atom*.

I <sub>3</sub> <sup>-</sup>	b.	COCl <sub>2</sub>	b.
	c.		c.
	d.		d.
	e.		e.
SbCl <sub>5</sub> <sup>+</sup>	b.	XeO <sub>2</sub> F <sub>2</sub>	b.
	c.		c.
	d.		d.
	e.		e.

4. Calculate the wavelength, in nm, of light emitted when an electron drops from the 5<sup>th</sup> energy level to the 2<sup>nd</sup> energy level in a He<sup>+</sup> ion.

5. Estimate the enthalpy change for the combustion of ethane,  $C_2H_6$ , using bond energies. The Lewis



structure of ethane is:

6. Give the *molecular orbital diagram* for  $N_2$ ,  $N_2^+$ , and  $N_2^-$ . State which is *more stable and why* you determined it to be more stable.