/70

AP Chemistry – Waves, Light, Photons – 4

Name _____Per ___

1. Calculate the energy of one photon of yellow light whose wavelength is 589 nm.

2. Using the Bohr model of the hydrogen atom, which energy transition produces the longest wavelength spectral line? Explain your answers.

(a) n=2 to n=1
(b) n=3 to n=2
(c) n=4 to n=3

3. What is the wavelength of an electron with a velocity of 5.97×10^{6} m/s? (The mass of an electron is 9.11×10^{-28} g.)

4. Calculate the energy associated with an electron that goes from n=1 to n=3.

5. How many orbitals in an atom can have each of the following designations?

(a) 3s
(b) 2p
(c) 4d
(d) n=3

6. Using only the periodic table as your guide, write the condensed electron configurations of the following species:

(a) Na

(b) Cl^-

(c) Co

(d) Co^{3+}

(e) Sr

7. Fill in the gaps in the following table assuming each column represents a neutral atom.

Symbol	^{121}Sb				
Protons		38			94
Neutrons		50	108		
Electrons			74	57	
Mass Number				139	239

8. Using only the periodic table as your guide, predict the charges of the ions of the following elements:

a) P b) Sr c) K d) F

9. Predict the chemical formulas of the compounds formed by the following pairs of ions:

a) NH_4^+ and SO_4^{-2} _____

b) Cu^+ and S^{-2} _____

c) La^{+3} and F^- _____

d) Ca^{+2} and PO_4^{-3} _____

e) Cd^{+2} and CO_3^{-2} _____

f) Ag^+ and N^{-3} _____

10. Which of the following compounds are ionic and which are molecular?

a) PF_5 _____

b) NaI _____

c) SCl_2 _____

d) $Ca(NO_3)_2$ _____

e) $FeCl_3$ _____

f) LaP _____

g) $CoCO_3$ _____

h) N_2O_4 _____

11. Selenium, an element required nutritionally in trace quantities, forms compounds analogous to those of sulfur. Name the following ions:

a) SeO_4^{-2} _____

b) Se^{-2} _____

c) HSe^- _____

d) $HSeO_3^-$ _____

12. Name the following ionic compounds:

a) Li_2O _____

b) $Fe_2(CO_3)_3$ _____

c) NaClO _____

d) $(NH_4)_2SO_3$ _____

e) $Sr(CN)_2$ _____

f) $Cr(OH)_3$ _____

g) $Co(NO_3)_2$ _____

h) NaH_2PO_4 _____

i) $KMnO_4$ _____