AP CHEMISTRY CHAPTER 7 SAMPLE PROBLEMS

Sample problem 1

The brilliant red colors seen in fireworks are due to the emission of light with wavelengths around 650. nm when strontium salts such as strontium nitrate and strontium carbonate are heated. Calculate the frequency of red light of wavelength 650. nm

Sample problem 2

The blue color in fireworks is often achieved by heating copper (I) chloride (CuCl) to about 1200oC. Then the compound emits blue light having a wavelength of 450. nm. What is the increment of energy (the quantum) that is emitted at 450. nm by CuCl?

Sample problem 3

Compare the wavelength for an electron (mass = 9.11 x 10-31 kg) traveling at a speed of 1.0 x 107 m/s with that for a ball (mass = 0.10 kg) traveling at 35 m/s.

Sample problem 4

Give the electron configurations for sulfur, cadmium, hafnium, and radium

Sample problem 5

The first ionization energy for phosphorus is 1060 kJ/mol and that for sulfur is 1005 kJ/mol. Why?

Sample problem 6

Consider atoms with the following electron configurations

1s22s22p6

1s22s22p63s1

1s22s22p63s2

Which atom has the largest first ionization energy, and which one has the smallest second ionization energy? Explain your choices

Sample problem 7

Predict the trend in radius for the following ions: Be2+, Mg2+. Ca2+, and Sr2+