

TSOKOS READING ACTIVITY

Section 7-1A (4 Points)

1. Essential Idea: In the microscopic world energy is discrete.
2. Theory Of Knowledge:
 - a. The role of luck/serendipity in successful scientific discovery is almost inevitably accompanied by a scientifically curious mind that will pursue the outcome of the “lucky” event.
 - b. To what extent might scientific discoveries that have been described as being the result of luck actually be better described as being the result of reason or intuition?
3. Understandings:
 - a. Discrete energy and discrete energy levels
 - b. Transitions between energy levels
 - c. Fundamental forces and their properties
 - d. Isotopes
4. Applications And Skills:
 - a. Describing the emission and absorption spectrum of common gases
 - b. Solving problems involving atomic spectra, including calculating the wavelength of photons emitted during atomic transitions
5. Data Booklet Reference:
 - a. $E = hf$
 - b. $\lambda = \frac{hc}{E}$
6. Read the first half of section 7-1 in your textbook (pgs. 270 to 275, thru Isotopes) and then answer the following questions and/or perform the tasks that follow.

a. What is the meaning of ‘discrete energy’? _____

b. What is so special about the emission spectrum of an element? _____

c. What do energy level diagrams tell us? _____

- d. How did Bohr relate energy levels to emission spectra? _____

- e. Einstein gave us two equations for the energy of a photon. What are they? _____

- f. What is the value of Planck's constant? _____
- g. What is the conversion factor for electron volts (eV) to Joules (J)? (*this is extremely important to remember*) _____
- h. Differentiate between the 'ground state' and 'excited state' of an electron. (Iowa vs. Nevada doesn't count). _____

- i. What does an electron do to relax (the relaxation process)? _____

- j. What is the difference between an absorption spectrum and an emission spectrum? _____

- k. What is the difference between an 'A' number, a 'Z' and number and an 'N' number and how are they represented on a periodic table? _____

- l. What is a 'nuclide' and how does it differ from the old one? _____

- m. List the symbols for the following particles. (*writing them helps your remember them*)
- i. proton _____
 - ii. neutron _____
 - iii. electron _____

iv. positron _____

v. photon _____

vi. alpha particle _____

vii. neutrino _____

viii. anti-neutrino _____

n. What are isotopes? _____

o. How do the chemical and physical properties of an element differ between isotopes? _____

p. What are isotopes evidence of? _____

7. Answers may be typed or neatly printed. Drawings may be freehand, but try to make use of the 'Shapes' or 'Insert Clipart' functions of MS Word. If you submit this assignment electronically, the filename must be in the following format, "LastnameFirstinitialPerXReadActX-X".