Chem I Name _____

Date _____ Per _____

Electron Configurations Test Review

I. Our Current Understanding of Where Electrons Are In An Atom

1. The Flow of Ideas: Put numbers in the blanks on the left to put the following ideas in order. Then put names in the large blanks to give credit where credit is due. (One of the names is used more than once.)

__1__ Light travels in waves. (This was already known.)

_____ Came up with a model that could explain the line spectrum of hydrogen but didn't work for the line spectra of any of the other elements.

_____

_____ "Maybe light travels in tiny packets of energy that I'll call quanta":

_____

_____ Came up with an equation that gives us the shapes of the s,p,d and f orbitals.

_____

_____ "Maybe electrons (which are particles) travel in waves."

_____

_____ "You can't know both the speed and the position of an electron as it travels around the nucleus at the same time. Sorry."

_____

_____ Explained the photoelectric effect and called the packets of light "photons."

_____

_____ "Maybe electrons travel in standing waves as they travel around the nucleus."

_____

2. Draw a picture of the Bohr model of an atom and show how electrons changing obitals explains the colors on the line spectrum of hydrogen.

3. Draw a picture of an atom showing the nucleus with 1s, 2s, and 2p orbitals around it.

II. Electron Configurations. Use your colored periodic table or an arrow diagram.
Note: I will provide a colored (well, shaded) periodic table for the test.

1. What is the full electron configuration of each of these (no noble gas shortcut)?

a. O _____

b. Ca _____

c. Ni _____

2. What is the noble gas shortcut electron configuration of each of these?

a. K _____ e. Bi _____

b. P _____ f. Dy _____

c. V _____ g. Rf _____

d. Ag _____ h. Np _____

3. What is the last placed electron of each of these?

a. Cs _____ d. Ar _____ g. Th _____

b. Hf _____ e. As _____ h. Sc _____

c. S _____ f. Hg _____ i. Nd _____

III. Valence Electrons

1. What ARE valence electrons? _____

_____

2. Why are valence electrons important? _____

_____

3. How many valence electrons do each of the following have?

a. _____ Mg d. _____ Uub g. _____ Xe

b. _____ Zn e. _____ U h. _____ C

c. _____ Fr f. _____ O i. _____ N

IV. Atomic Sizes. For each of the following, circle the larger of the two atoms:

Na or K P or S Au or Ag H or He Xe or Kr Y or Zr

V. Putting It All Together. Without looking at any other periodic tables, mark the blank periodic table below with the following symbols:

1. Put a star in the element whose electron configuration is $1s^2 2s^2 2p^6 3s^2 3p^4$.

2. Put a circle in all the elements whose last placed electron is a d^3.

3. Put an exclamation point in the element whose electron configuration is [Kr] $5s^2$.

4. Put a box in the element whose last placed electron is $5f^{11}$.

5. Put an "X" in the elements that have five valence electrons .

6. Put a smug happy face in the lightest element to have an electron in a d orbital.

7. Put an "s" in the smallest sized atom.

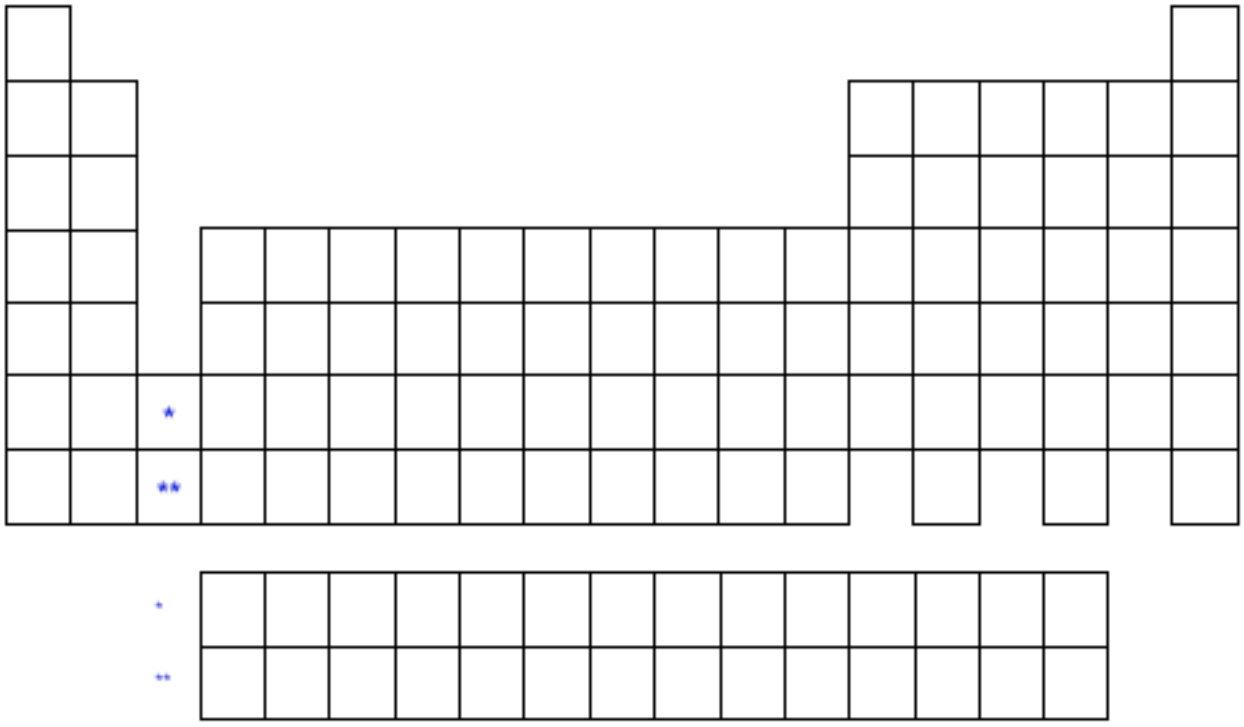
8. Put a "b" in the largest sized element.

9. Put an "L" in the lightest element.

10. Put an "h" in the heaviest element.

11. Put a slash (/) in all the elements that have 8 valence electrons.

12. Put a "T" in what is most likely the largest sized transition element.



VI. Enough of this theory - let's talk **Moles**. (Show set ups and do sig figs if they apply.)

1. The smaller number in each box on the periodic table tells us how many _____ are in an atom of that element.

2. The bigger number in each box on the periodic table tells us the average number of

_____ and _____ that are in an atom of that element. It also

tells us how many _____ that one _____ of that element weighs.

3. One mole = _____ . Its other name is _____

_____.

4. How many grams does one mole of gold weigh? _____

Tin? _____ The smallest of the metalloids? _____

5. If you had 4.78 moles of anything, how many of those things would you have? (Show a set up with units for this. Use the word "things")

6. If you had 12.5 moles of carbon,

a. How much would it weigh in grams?

b. How many atoms would it be?

7. How many atoms would there be in a 37.9 gram sample of zinc?

8. How much would 2.75×10^{30} atoms of aluminum weigh?

9. On a scale of 1-10, how confident are you with this material? _____
If your number was low, do you know what you need to do to ace the test?