

Chem I

Name _____

Date _____ Per _____

Worksheet #C19: Valence Electrons and Electron Configurations and Atomic Sizes

1. Draw the arrow diagram yet again in the space below if you use it instead of the colored chart:

2. What is the full electron configuration of Cu? _____

3. Use either the arrow chart or your colored chart to write out the noble gas shortcut for these:

a. Se _____

f. Ce _____

b. Rh _____

g. C _____

c. U _____

h. Pb _____

d. Mg _____

i. Br _____

e. Sb _____

j. Na _____

4. What are valence electrons? _____

5. What two kinds of orbitals contribute to the valence electrons? _____ and _____

6. How many valence electrons do each of the elements in the d and f blocks have? _____

a. When might there be an exception to this? _____

7. Why are valence electrons important? _____

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

a. Li _____ d. As _____ g. Se _____ j. Ca _____ m. Na _____

b. P _____ e. C _____ h. In _____ k. Rb _____ n. O _____

c. S _____ f. K _____ i. Sr _____ l. Po _____ o. Bi _____

For the rest of these questions refer to the chart on the next page.

9. Trends In The Table: Across the periods.

- a. As you go from left to right on the table do the radii of the atoms tend to get bigger or smaller? _____
- b. Wait! Look at another periodic table. As you go from left to right on the table does the average atomic mass of the atoms get bigger or smaller? _____
- c. So even though the atoms are getting heavier they're getting smaller as you go across the chart. Why is this? _____

- d. Are there any exceptions to this trend?(Scan the radii.) _____

10. Trends In The Table: Down the groups.

- a. As you down the groups do the radii of the atoms tend to get bigger or smaller? _____
- b. Why? _____

- c. Are there any exceptions to this trend? (Again, scan the radii.) _____

11. If there weren't any exceptions, which of these would have the larger radius? (Circle the largest.) Consult only a regular periodic table for your answers, not the chart on the next page.

- | | | | |
|--------------|--------------------|--------------|--------------|
| a. Na or Ar? | d. Os or Hs or Fe? | g. La or Ho? | j. Ar or Xe? |
| b. Na or Fr? | e. Xe or In or Rb? | h. Pu or Fr? | |
| c. Ca or Se? | f. H or He? | i. N or Sb? | |

12. Which of all the atoms has the largest radius? _____ The smallest radius? _____

This chart shows the radii of the atoms of the elements in picometers.
 Picometers are really small: 1 picometer = 1×10^{-12} meters.

H 37																		He 32
Li 152	Be 111												B 86	C 77	N 70	O 73	F 72	Ne 71
Na 186	Mg 160												Al 143	Si 118	P 108	S 106	Cl 99	Ar 97
K 232	Ca 197		Sc 162	Ti 147	V 134	Cr 128	Mn 127	Fe 126	Co 125	Ni 124	Cu 128	Zn 134	Ga 135	Ge 128	As 125	Se 116	Br 114	Kr 110
Rb 248	Sr 215		Y 180	Zr 160	Nb 146	Mo 139	Tc 136	Ru 134	Rh 134	Pd 137	Ag 144	Cd 149	In 167	Sn 151	Sb 145	Te 142	I 133	Xe 130
Cs 265	Ba 217	*	Lu 174	Hf 159	Ta 146	W 139	Re 137	Os 135	Ir 136	Pt 139	Au 144	Hg 151	Tl 170	Pb 175	Bi 155	Po 164	At 140	Rn 141
Fr 270	Ra 220	**	Lr -----	Rf -----	Db -----	Sg -----	Bh -----	Hs -----	Mt -----	Ds -----	Rg -----	Uub -----	UUt -----	Uuq -----	Uup -----	Uuh -----	Uus -----	Uuo -----

*	La 183	Ce 182	Pr 182	Nd 181	Pm 183	Sm 180	Eu 208	Gd 180	Tb 177	Dy 178	Ho 176	Er 176	Tm 176	Yb -----
**	Ac 188	Th 179	Pa 163	U 156	Np 155	Pu 159	Am 173	Cm 174	Bk -----	Cf 186	Es 186	Fm -----	Md -----	No -----