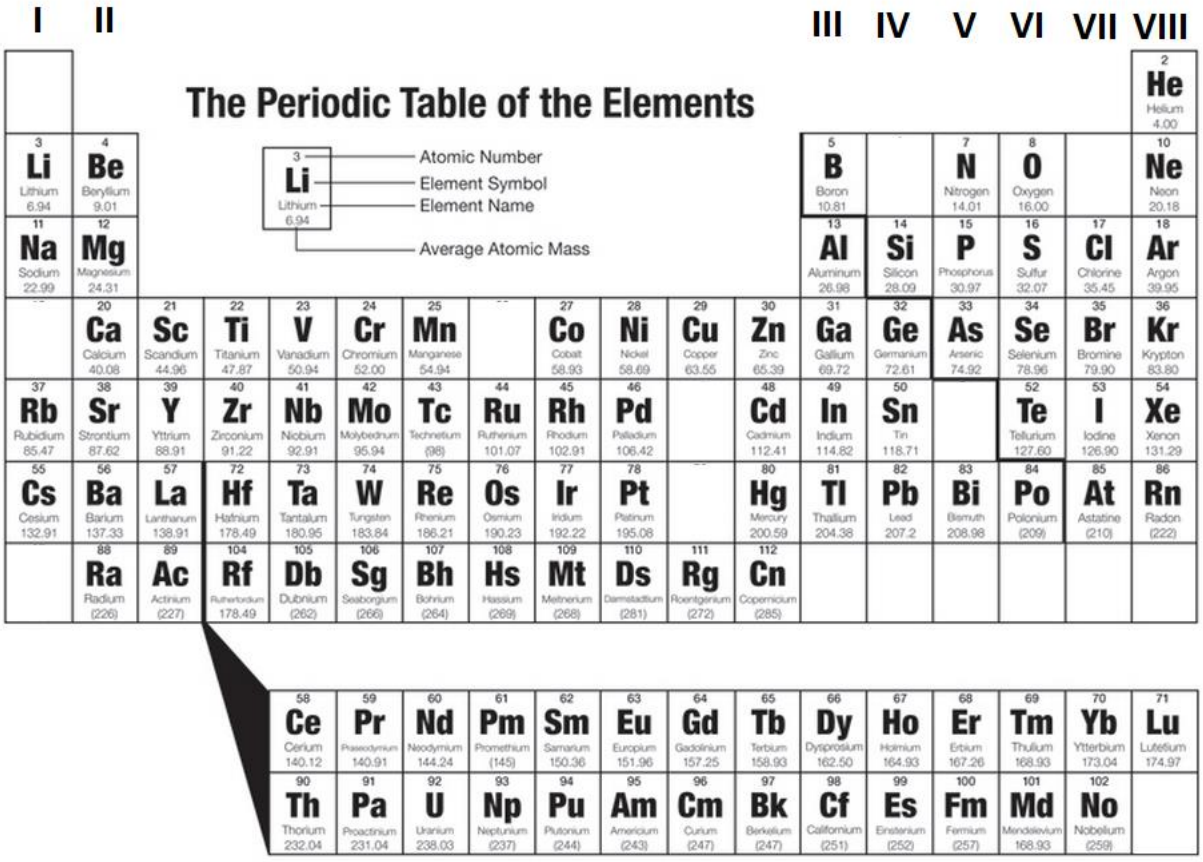
Worksheet 6 – CHEM 121 – Fall 2015 Monday Name: _____

Wednesday Name: _____

Directions: First 40 minutes with your partner, non-programmable calculator and no notes; next 10 minutes with notes; remaining 25 minutes on the board.

1) Complete (Fill in) the following periodic table:



2. Ba has how many protons? Electrons?

3. B has how many electrons in its valence shell?

4) Sr has how many electrons in its valence shell?

5) Identify which of the following reactions are reduction or oxidation reactions:

A) $Cu2+ + 1e- \rightarrow Cu^{+}$ B) $Fe \rightarrow Fe^{2+} + 2e^{-}$ C) $Zn \rightarrow Zn^{2+} + 2e^{-}$

D) $Mg^{2+} + 2e^{-} \rightarrow Mg$ E) $Fe \rightarrow Fe^{3+} + 3e^{-}$ F) $Hg_2^{2+} + 2e^{-} \rightarrow 2Hg$

G) $Li \rightarrow Li^{+} + 1e^{-}$ H) $Be^{2+} + 2e^{-} \rightarrow Be$ I) $F_2 + 2e^{-} \rightarrow 2F^{-}$

J) $Al \rightarrow Al^{3+} + 3e^{-}$

6) Why are the oxidation reactions oxidation? Why are the reduction reactions reduction? If you had to come up with a mnemonic for these two kinds of reactions, what would it be and why? How does your mnemonic work?

7) Given the following reactions, determine which reactant is oxidized and which reactant is reduced:

A) $Mn + Zn^{2+} \rightarrow Mn^{2+} + Zn$ B) $2Al^{3+} + 3Pb \rightarrow 2Al + 3Pb^{2+}$ C) $Na + Cl \rightarrow Na^{+} + Cl^{-}$

D) $2Li + O \rightarrow 2Li^{+} + O^{2-}$ E) $2Na + S \rightarrow 2Na^{+} + S^{2-}$

8) Based on your responses to #7, above, which reactant is the oxidizing agent and which reactant is the reducing agent?

9) Based upon your new understanding of "simple" redox reactions, balance the following reactions:

A) $Cu^{2+} + Zn \rightarrow Cu + Zn^{2+}$

B) $Fe + Fe \rightarrow Fe^{2+} + Fe^{3+}$

C) $Be^{2+} + Al \rightarrow Be + Al^{3+}$

D) $Zn + Mg^{2+} \rightarrow Zn^{2+} + Mg$

E) $Fe + Al \rightarrow Al^{3+} + Fe^{3+}$

F) $Fe + Be^{2+} \rightarrow Fe^{2+} + Be$

10) There are two isotopes of Lithium: ^{6}Li and ^{7}Li. There's 12 times as much ^{7}Li as ^{6}Li. What is the average mass of Li?

11) There are three isotopes of Magnesium: ^{24}Mg, ^{25}Mg and ^{26}Mg. There's 8 times as much ^{24}Mg as there is ^{25}Mg and ^{26}Mg. What is the average mass of Mg?

12) There are two isotopes of Copper: ^{63}Cu and ^{65}Cu. There's 2 times as much ^{63}Cu as ^{65}Cu. What is the average mass of Cu?

13) There are three isotopes of Silicon: ^{28}Si, ^{29}Si and ^{30}Si. There's 20 times as much ^{28}Si as there is ^{29}Si and ^{30}Si. What is the average mass of Si?

14) There are two isotopes of Silver: ^{107}Ag and ^{108}Ag. These isotopes are present in nature in equal amounts. What is the average mass of Ag?

15) There are 4 isotopes of Cadmium: ^{112}Cd, ^{113}Cd, ^{114}Cd and ^{115}Cd. Respectively, they are present, abundancy-wise in nature as, 3 parts ^{112}Cd, 2 parts ^{113}Cd, 4 parts ^{114}Cd and 1 part ^{115}Cd. What is the average mass of Cd?

Isotope Abundance Data source: http://www.ncsu.edu/ncsu/pams/chem/msf/pdf/IsotopicMass_NaturalAbundance.pdf, accessed 20 September 2015, 1555 hours PDT

16) Color the metals in the periodic table in #1 in light blue; the non-metals in yellow; the metalloids in light green (yes, you'll need colored pencils in class).

17) What is a cation?

18) What is an anion?

19) What are the two "magic numbers" for elements when they ionize? With which ionic form (cation or anion) do they align?

20) Draw your version of the atomic vs ionic radii for Be and Cs, below.

21) Do the same as in #20 for N and S, below.

22) The most electronegative element on the periodic table is:

23) The most electropositive element on the periodic table is:

24) Explain how your responses to #'s 22 and 23 are dependent upon the first ionization energy for both elements.

25) From your readings, select one topic that you didn't think was very clearly explained. Explain it to your comprehension satisfaction clearly and concisely in the space below (**ONLY in the space below!**).