## In Class Assignment 2: The Periodic Table and Some Review

(You can use your book or the internet to help you)

## The Periodic Table

Label the following on your periodic table:

- Metals
- Non-metals
- Metalloids (or semi-metals)
- Transition metals
- Lanthanides
- Actinides
- Main group elements
- Halogens
- Alkali metals
- Alkaline earth metals
- Chalcogens
- Noble gases
- Groups (I-VIIIA and 1-18)
- Periods (1-7)
- Atoms that commonly form +1, +2, +3 ions (not all of them, just the obvious ones based on the periodic table)
- Atoms that commonly form -1, -2, -3 ions

What combinations of two elements generally give ionic compounds?

What combinations of two elements generally give covalent compounds?

What is the group number of radon (give both the roman numeral A/B notation and 1-18 notation)?

What is the special group on the periodic table that is rubidium a member of?

What is the name of the halogen in period 5?

Is antimony a metal, a non-metal or a metalloid?

What is the name of the alkali metal in period 3?

Classify the element selenium in as many ways as you can:

Chem 130, Eppley

## Some Review: Protons, Neutrons, and Electrons

Consider the radioactive element technetium that is used as a medical imaging agent: How many protons, neutrons, and electrons does <sup>99</sup>Tc have?

For <sup>99</sup>Tc, what is its mass number? What is its atomic number? Which one of these makes it "technetium"?

Technetium has three common positive "oxidation states" (charges): +2,+3, and +7. How many protons, neutrons, and electrons does each of these have if it is still the <sup>99</sup>Tc isotope?

<sup>99</sup>Tc<sup>2+</sup>:

<sup>99</sup>Tc<sup>3+</sup>:

<sup>99</sup>Tc<sup>7+</sup>:

How is the atomic mass that is listed on the periodic table for an element related to the mass numbers of individual isotopes like <sup>99</sup>Tc?

## Writing Formulas for Ionic Compounds

When you write a formula for an ionic compound, you need to take the charges into account so that the compound you form has a neutral charge. For instance, if you are forming a compound between  $AI^{3+}$  and the sulfate ion  $(SO_4^{2-})$ , the total positive charge and negative charge must balance, so you need 2  $AI^{3+}$  and 3  $SO_4^{2-}$  ions:  $AI_2(SO_4)_3$ . Notice that when you write the formula for the neutral compound, the charges are not included. Always write the cation before the anion in the formula!

Write the formulas for the ionic compounds formed by the combination of the following:

The most common ion of calcium and the most common ion of oxygen:

The most common ion of chlorine and the ion of iron with 23 electrons:

The most common ion of zinc and the polyatomic ion NO<sub>3</sub><sup>-</sup>: