Chemistry 161a – Fall 2018 **Chapter 2 Discussion**

Note: The following is a good start, but you should spend a lot of time practicing the naming protocols.

1. Write the formulas for each of the following compounds.
   1) silver(I) cyanide
   2) calcium hypochlorite
   3) potassium chlorate
   4) iron(III) nitrite

2. Name the following compounds given their chemical formulas. Discuss any choices you had to make along the way.
   1) CaF_2
   2) P_2O_5
   3) Cu_2S
   4) CuS
   5) NH_4ClO

3. Name/identify the following acids.
   1) H_2CO_3
   2) hydrofluoric acid
   3) nitrous acid
   4) $HMnO_4$

4. Which compound(s) are incorrectly named? If incorrect, fix them.
   1) P_4O_{10}: pentaphosphorous decaoxide
   2) Na_2SO_4: sodium sulfite
   3) $HClO_4$: perchlorous acid

5. There are three stable isotopes of magnesium. Their masses are 23.9850, 24.9858, and 25.9826 amu. If the average atomic mass of magnesium is 24.3050 amu and the natural abundance of the lightest isotope is 78.99%, what are the natural abundances of the other two isotopes?

6. Fill in the missing information:

Symbol	$^{137}_{55}Cs^{+}$	$^{56}_{26}Fe^{3+}$	$^{17}_{8}O^{2-}$			
# Protons				30		40
# Neutrons				34	16	
# Electrons				28	18	36
Mass Number					32	90

7. What is the symbol for the element with a –1 charge, 36 electrons, and 46 neutrons?

8. A compound contains an unknown ion X^{n+} (n is the charge) and has the formula XCl_2. If ion X^{n+} contains 10 electrons, what is the identify of X^{n+}?

9. A certain ion has a charge of 2+ and 27 electrons. Which ion is it?

10. Given the table below, calculate the mass of the nucleus of a He atom.

Particle	**Mass (kg)**
Neutron	1.67493×10^{-27}
Proton	1.67262×10^{-27}
Electron	9.10939×10^{-31}
$^{4}_{2}He$	6.64465×10^{-27}

The last entry in the table above gives the mass of a helium atom. Compare the mass of the nucleus you calculated to this value. What is the calculated difference?

Weird. Why is this not zero? Where did this mass go? The difference between these two quantities is called the "mass defect" and it is the energy/mass lost when the individual nucleons come together (reference Einstein's equation where $E = mc^2$)! This would also be the energy you would need to tear apart the nucleus (nuclear binding energy), which indicates how stable a nucleus is.