**Quiz 10**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. Complete the following nuclear equations. Write the mass number and atomic number for the remaining particle, as well as its symbol (4 points).
2. If the mass number of an isotope is more than twice the atomic number, is the neutron-to-proton ratio less than, greater than, or equal to one (2 points)?

The neutron-to-proton ratio is greater than one.

1. What is the difference between the level of radioactivity and a dose of radioactivity (4 points)?

The level of radioactivity is the amount of radioactive particles present in a given instant of time. The dose is the accumulation of exposure over a length of time.

1. Determine the number of unpaired electrons, and magnetism (paramagnetic or diamagnetic) in the following tetrahedral complexes. All tetrahedral complexes are high spin (8 points).
   1. [FeCl4]2- Fe2+, d6, paramagnetic, four unpaired electrons
   2. Na2[CoCl4] Co2+, d7, paramagnetic, three unpaired electrons
   3. [MnCl4]2- Mn2+, d5, paramagnetic, five unpaired electrons
   4. (NH4)­2[ZnCl4] Zn2+, d10, diamagnetic, zero unpaired electrons
2. Is this week’s experiment quantitative or qualitative (2 points)? \_\_\_qualitative\_\_\_\_\_\_\_\_