Practice Questions for Chapter 2 Blank

1. Write the correct symbol, with both superscript and subscript (nuclide symbol) for the ions and atoms listed below:
    a. The ion that has 30 protons and 36 neutrons and a +3 charge?
    b. The nuclide symbol for the element that has 79 electrons and 118 neutrons?
    c. The nuclide symbol for a bromine-80 atom.

2. Recently surfaced is " The Periodic Table of Rejected Elements," constructed by Gerber and Schwartz, noted table-ologists. There is something wrong with the name, the symbol or both. As a hint, they have included the atomic number, which is the only thing correct in this periodic table. Please correct the errors by writing BOTH the name and symbol.

    Artistic elements:
    a) 27 Mondrianium (Ma)
    b) 3 Picasso (Pi)
    c) 24 Hopper (Hp)
    d) 37 Celinedion (Cd)

3. Draw the microscopic picture that represents an isotope of carbon with a mass number of 13 amu. Acceptable:

4. Each of the statements given below is true, but Dalton might have had trouble explaining some of them with his atomic theory. Give an explanation why the following statements are true, yet were not explained in Dalton's atomic theory.

    a) Ethyl alcohol and dimethyl ether have the same composition by mass (52% carbon, 13% hydrogen and 35% oxygen) yet the two have different melting points, boiling points, and solubility in water.
    b) Burning wood leaves an ash that is only a small fraction of the mass of the original wood.
    c) Atoms can be broken down into smaller, subatomic particles.

5. What is the formula for caffeine: 8 carbons; 10 hydrogens, 4 nitrogens and 2 oxygens?

6. In Chapter 2, we studied the basic architecture of the atom. Answer the following by identifying the true and false statements. Correct the false statements and make then true. Use a complete sentence for full credit.
   a) [T] [F] The atomic number indicates the number of electrons and neutrons.
   b) T] [F] Protons and electrons reside in the atomic nucleus.
   c) [T] [F] The electron and the proton have about the same mass to three significant figures, 1.00 amu.
   d) [T] [F] The charge of the proton and the neutron are equal but opposite in sign.
   e) [T] [F] The electron has most of the mass and comprises the volume of the atom.

7. Two isotopes of element Q (not its real symbol) are ^{97}Q (23.4 % abundance) and ^{94}Q (76.6% abundance). ^{97}Q is 8.082 times heavier than ^{12}C (12.000 000 amu) and $^{94}Q$is 7.833 times heavier than ^{12}C. What is the weight atomic mass of element Q?

Two isotopes of chlorine exist in nature, chlorine-35 and chlorine 37. The weighted atomic mass (atomic weight) of chlorine is 35.4527 amu. The atomic masses of ^{35}Cl and ^{37}Cl is 34.968 852 amu and 36.965 903 amu respectively. Calculate the percent abundance for each isotope

8. Give one example (atomic symbol and name) for each of the following:
   a. A transition element, which is ferromagnetic besides Fe.
   b. The halogen that is a solid
   c. The main group (representative) element in the third period and 4th group
   d. An alkali metal in the fourth period
   e. An alkaline earth metal in the second period

9. Torbernite is a mineral structurally similar to mica, The formula unit is $Cu(UO_2)_2(PO_4)\bullet 10H_2O$. [There are 10 waters in the formula]

   a) What is formula mass of torbernite? Use the following atomic masses for your calculation.

Cu-63.546 amu
U-238.02891 amu
O-15.9994 amu
P-30.973762 amu
H-1.00794 amu

b) What is this mass in grams of one formula unit?

10. In Chapter 2, we are introduced to the periodic table. Answer the following by identifying the true and false statements. Correct the false statements and make then true by writing a complete sentence, not crossing out and repairing the answer.
    a) In the modern periodic table, the elements are arranged in order of increasing atomic mass. [T] **[F]**
    b) Elements in a period have similar chemical properties [T] **[F]**
    c) Elements can be classified as either metalloids or non metals. [T] [F]
    d) Non-metals are ductile, malleable, lustrous solids (for the most part) that are good conductors of heat. [T] **[F]**
    e) Aluminum is a metalloid. [T] **[F]**

11. Predict the formula formed from the following pairs of elements. DO NOT NAME THE COMPOUND!

a) Ra and S
b) K and N
c) Mg and P