Unit 3 Atomic Structure and Periodic Table Review Worksheet

1. What are the allowed values for *l*, the angular momentum quantum number when *n*, the principle quantum number is equal to 3?
2. List the orbitals present in the 4p subshell (include subscript designations).
3. How many electrons can the *n* = 3 shell hold?
4. How many orbitals are contained in a 6d subshell?
5. Describe the shape of an *s* orbital.
6. What are the values for the four quantum numbers for the two electrons of He?
7. What is the value of the principle quantum number for the top row of the transitions metals?
8. How many elements are located in the 4f subshell?
9. Indicate if 2, 1, -1, +1/2 is a (valid/invalid) set of quantum numbers.
10. Which subshell has a lower energy, 5d or 4p?

Identify the element described below using its atomic symbol.

1. Third period element in group 16.
2. Has an electron configuration of [Ar]4s23d9
3. The liquid halogen.
4. The molecular element in period 4.
5. Has an average atomic mass equal to 40.
6. The smallest alkaline earth metal.
7. The *n* = 3 element in group 6B.
8. The first element in the 5p subshell.
9. Has an electron configuration of [Xe]6s24f8
10. The noble gas with an atomic number between 35 and 45.

21. Circle the atom or ion in each pair that has the largest radius. Justify your choice.

# a. Mg or Cl b. Na or Na+

22. Circle the atom in each pair that has the greater ionization energy Justify your choice.

a. Kr or Ar b. Br or K

23. Circle the atom in each pair that has the greater electronegativity. Justify your choice. a. O or N b. Pb or Se

24. Give the orbital notation for the following:

a) nitrogen b) Li+

1s 2s 2p 3s 3p 1s 2s 2p 3s 3p

25. Give the complete electron configuration for the following:

a) iron b) argon

26. Give the abbreviated electron configuration for the following:

a) titanium b) lead

27. A 15.00 g sample of a compound of iron and oxygen was found to contain 6.35 g of iron. What is the percent composition of each element in this compound?

28. When 12.5 grams of calcium are burned in oxygen, 17.5 grams of calcium oxide are formed. How many grams of oxygen were consumed in this reaction?

29. Use the data below to determine the average atomic mass of Silicon

mass percent abundance

28Si 27.976927 92.2297

29Si 28.976495 4.6832

30Si 29.973770 3.0872