Homework #3: Chemistry 1013 Fall 2017

Due Friday 22 September in class 30 pts

Your name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Write the complete and abbreviated ground electronic state configuration for: (3 pts)

*Complete, ground state electronic configuration Abbreviated ground state configuration*

1. S 1s22s22p63s23p4 [Ne] 3s23p4
2. Li 1s22s1 [He]2s1
3. Ca 1s22s22p63s23p64s2 [Ar]4s2

2. Use Doc’s `corrections’ to d electron configurations of transition elements and write the

actual abbreviated, ground state electronic configurations for: (4 pts)

1. Cu [Ar] 3d104s1
2. Fe2+  [Ar] 3d5 4s1

3. Draw the Lewis dot structures for: (3 pts)

..

1. O :O:
2. Ca Ca:

.

1. P :P:

4. Electron counting (3 pts)

1. How many valence electrons does Cl have ? \_\_7\_\_\_\_\_\_
2. How many valence electrons are in the element with the following complete, ground state

electronic configuration ? 1s22s22p63s23p4 \_\_\_\_\_\_6\_\_\_\_\_ valence count

1. How many valence electrons does Ga have ? \_\_\_3\_\_\_\_

5. There are two main kinds of bonding that glue atoms together to form compounds.

Name them: \_\_\_\_ionic\_\_\_\_\_\_\_\_\_\_bonding and \_\_\_\_\_\_covalent\_\_\_\_\_\_\_\_\_ bonding (2 pts)

6. Problem 3.102 (p. 121):

1. NH3 \_\_\_compound\_\_\_\_\_\_ b) N2\_\_element\_\_\_\_\_\_\_ c) S8\_\_\_\_element\_\_\_\_

7. What are the likely charges on stable ionic forms of the elements listed below? (5 pts)

|  |  |
| --- | --- |
| element | Stable charge |
| Ca | +2 |
| F | -1 |
| Li | +1 |
| O | -2 |
| N | -3 |

..

8. Using the method described on pg. 82-85 of your text, determine the likely formula of ionic compounds formed from the following elements: (3 pts)

1. Li and O \_\_\_Li2O\_\_\_\_\_\_\_\_\_\_ b) Mg and N \_\_\_\_Mg3N2\_\_\_\_ c) Fe3+ and O \_\_Fe2O3\_\_\_\_

9. How many electrons are needed to form a covalent bond?? \_\_\_\_\_\_\_2\_\_\_\_\_\_\_\_

10. In covalent bonding, electrons between bonding atoms are:\_\_\_\_shared\_\_\_\_\_\_\_\_\_\_

11. A covalent compound called ethene is drawn below.

1. How many electrons bind the two C to each other ? \_4\_\_\_\_\_\_
2. How many electrons total are found in the bonds of ethane ? \_\_12\_\_\_



ethene