Electron Configuration Worksheet and More!!

Brief Instructions

An electron configuration is a method of indicating the arrangement of electrons about a nucleus. A typical electron configuration consists of numbers, letters, and superscripts with the following format:

1. A number indicates the energy level. The number is called the principal quantum number.
2. A letter indicates the type of orbital: s, p, d, f.
3. A superscript indicates the number of electrons in the orbital. Example: $1s^2$ means that there are two electrons in the 's' orbital of the first energy level. The element is helium.

To write an electron configuration:

1. Determine the total number of electrons to be represented. Use your PT!
2. Orbitals are considered to be in the same shell if they have the same first number (no matter in what order filling is done).
3. An atom will gain or lose electrons in order to have eight electrons in its outer shell. (The"Octet" Rule)
4. The outer shell is the highest numbered shell which has electrons in it. Only s and p orbitals are part of the outer shell.
5. An atom has the tendency to lose electrons (to another atom) or to gain electrons (from another atom) in order to make the outer shell complete with eight electrons. Atoms with a complete outer shell (eight electrons) are considered stable. Some atoms naturally have eight electrons in their outer shell and are very stable. (Helium is the exception being stable with two electrons in its outer shell.)

Configuration Writing Practice

Write a ground state electron configuration for each neutral atom. Ground state means that all of the lowest possible energy levels (up to the proper number of electrons for the element) are filled. For example, the electron configuration for Phosphorus is $1s^2 2s^2 2p^6 3s^2 3p^3$

1. Na

2. Pb

3. Sr

4. U

5. N

Electron Configuration Worksheet

Write the unabbreviated electron configurations of the following elements:

1) copper_____

2) iodine _____

3) potassium _____

4) bismuth _____

5) zirconium _____

Write the abbreviated electron configurations of the following elements:

6) iridium _____

7) chlorine _____

8) nobelium _____

9) caesium _____

10) magnesium _____

The following electron configurations belong to which elements:

11) $1s^2 2s^2 2p^6 3s^1$ _____

12) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^6$ _____

13) [Kr] $5s^2 4d^{10}$ _____

14) [Xe] $6s^2 4f^{14} 5d^{10} 6p^2$ _____

15) [Rn] $7s^2 5f^{14} 6d^4$ _____

Determine if the following electron configurations are correct:

16) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^6 5s^1$ _____

17) $1s^2 2s^2 2p^6 3s^3$ _____

18) [Rn] $7s^2 5f^9 6d^2$ _____

19) [Ar] $5s^2 4d^{10} 5p^5$ _____

20) [Xe] $6s^2 4f^{10}$ _____