

AP Chemistry - Ion Worksheet #1

Electron Configurations of Ions

1. Which of the following sets of atomic number and configuration represent the ground state electron configuration of an atom or ion? State which atom or ion it is.

- a) $A = 8, 1s^2 2s^2 2p^4$
- b) $A = 11, 1s^2 2s^2 2p^6$
- c) $A = 14, 1s^2 2s^2 2p^6 3s^2$
- d) $A = 22, 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

2. Write the correct electron configurations for:

- a) Pb^{4+}
- b) S^{2-}
- c) Fe^{3+}
- d) Zn^{2+}

3. Give the electron configurations for the following transition metal ions:

- a) Sc^{3+}
- b) Cr^{2+}
- c) Ag^{1+}
- d) Ni^{3+}

4. Of the following species ($\text{Sc}^0, \text{Ca}^{2+}, \text{Cl}^0, \text{S}^{2-}, \text{Ti}^{3+}$), which are isoelectric? Why?

5. Identify the group containing the element composed of atoms whose last electron:

- a) enters and fills an 's' subshell.
- b) enters but does not fill an 's' subshell.
- c) is the first to enter a 'p' subshell.
- d) is the next to the last in a given 'p' subshell.
- e) enters and fills a given 'p' subshell.
- f) is the first to enter a 's' subshell.
- g) half fills a 'd' subshell.

6. Write the electron configuration for argon. Name two positive and two negative ions that have this configuration.