

Big Chem: Unit 10 & 11 The Periodic Table

PRINT Name _____ Period _____

Use The Periodic Table of the Elements for the following problems:

1. Classify the following elements as metals, metalloids, or nonmetals:
 - a. cadmium, b. calcium, c. potassium, d. carbon, e. chlorine, f. oxygen, g. sulfur.
2. Predict the oxidation numbers for oxygen, lithium, and fluorine. *Hint: Remember that columns are families having the same oxidation number (valence), and the grand tendency of the elements.*
3. Element X has the following electron configuration
 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$
 - a. Locate its position on the periodic table. *Hint: count up the electrons for the Atomic Number.*
 - b. To what group and to what period does this element belong?
 - c. Classify the element as a metal, nonmetal, or metalloid.
 - d. List the properties associated with the classification you chose.
 - e. Predict the oxidation number of the element (its valence).
 - f. Draw the **electron dot diagram** for an atom of Chlorine. Draw the **electron dot diagram** for an ion of Chlorine. *Hint: a positive ion has lost electrons, a negative ion has gained electrons. And dot structures use outermost electrons s and p orbitals only. Ah Yaz!*
 - g. How does the size of an atom of Element X compare to that of an ion of Element X? *Hint: adding electrons increase the size of an ion, removing electrons decreases the size of an ion.*

For the Element Calcium:

- a. To what group and what period does this element belong?
- b. Classify the element as a metal, nonmetal, or metalloid.
- c. List the properties this element should exhibit based on the classification you chose in b.
- d. Write the electron configuration of the element.
- e. Predict the oxidation number of the element.
- f. Draw the electron dot diagram for both an atom and an ion of this element.