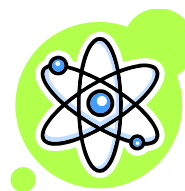


Electrons in Atoms



1. Draw orbital diagrams for the following elements. Be sure to show the complete electron configuration below your orbital diagram.
 - a. carbon
 - b. neon
 - c. potassium
 - d. zinc
2. Write complete electron configurations for the ground state of the following elements, and for each electron configuration, circle the valence electrons.
 - a. arsenic
 - b. rubidium
 - c. iodine
 - d. radon
3. Write the noble gas, or shorthand, notation for the following elements.
 - a. magnesium
 - b. rubidium
 - c. selenium
 - d. fluorine
4.
 - a. What are valence electrons?
 - b. In what sublevels are valence electrons always found?
 - c. How many valence electrons are needed to make an atom stable?
 - d. Which elements on the periodic table are considered extremely stable?
5. Helium has the following electron configuration: $1s^2$
 - a. What does the coefficient 1 represent?
 - b. What does the letter s represent?
 - c. What does the superscript 2 represent?

6. Draw Lewis Dot Structures for the indicated elements.
- a. sodium
 - b. beryllium
 - c. oxygen
 - d. aluminum
 - e. aluminum
 - f. arsenic
 - g. iodine
 - h. xenon
7. a. When an electron transitions from an excited state to the ground state, is the electron going from higher to lower energy levels or lower to higher energy levels?
- b. What is emitted when an electron transitions from an excited state to the ground state?
- c. How is this emission detected? (*i.e.*, what is observed?)
8. A flame test is performed in lab on four known compounds. A flame test is then performed on an *unknown* compound. Use the information collected in lab and shown in the chart below to help identify the unknown compound.

<u>Compound Name</u>	<u>Color Observed</u>
lithium chloride	red
sodium chloride	yellow
potassium chloride	purple
copper chloride	green
unknown	purple

- a. What is the identity of the unknown element?
- b. In complete sentences, explain how the unknown element can be identified using the data collected.