Atomic Properties & Bonding

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class:\_\_\_\_\_\_\_\_\_\_\_\_\_

Go to the website below and read the introduction. After that click on the Animation tab and work through each option, answering the questions as you go. After completing the assignment read the conclusion and take the quiz.

# http://bcs.whfreeman.com/webpub/Ektron/pol1e/Animated%20Tutorials/at0201/at\_0201\_chemical\_bond.htmlElectron Shells & Chemical Reactivity

1. What determines the chemical reactivity of an atom?
2. How many electrons are needed to fill:
   1. the 1st electron shell\_\_\_\_\_\_\_\_\_\_
   2. the 2nd electron shell\_\_\_\_\_\_\_\_\_\_
   3. the 3rd electron shell\_\_\_\_\_\_\_\_\_\_
3. Which shell has the lowest energy electrons
4. What is the octet rule
5. Why don’t sodium and chlorine behave the same with regards to electrons if they both want 8 electrons in their outer most shell?
6. What does inert mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. What is a chemical bond?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. What three things can an atom do to form a bond
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. Explain how 2 hydrogen atoms form a bond

# Covalent Bonds

1. What is a covalent bond
2. How many electrons are shared in a single covalent bond\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How many electrons are shared in a covalent double bond\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How many covalent bonds can carbon form?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Polarity & Hydrogen Bonding

1. What causes polarity?
2. In a diatomic molecule where both atoms are the same element, the covalent bond is always Polar / Nonpolar
3. What is electronegativity?
4. Are electrons drawn closer to atoms that have higher or lower electronegativity?
5. How would we indicate the partial charges on the following molecule?

O

H H

1. What is a hydrogen bond?
2. What determines if something will dissolve in water
3. What kinds of bonds hold 1 strand of DNA together?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What kind of bonds holds 2 separate strands of DNA together?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Ionic Bonds

1. What atomic property most determines if an atom will form an ion or a covalent bond?
2. What is an ion?
3. What do you call a
   1. positive ion 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. negative ion 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What kind of attraction holds ions together \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What makes the ionic bonds between sodium and chlorine ions so strong
6. List the following atoms in order of lowest electronegativity top highest (you may want to visit <http://www.tutor-homework.com/Chemistry_Help/electronegativity_table/electronegativity.html> for a hint)
7. How does electronegativity increase in the periodic table (hint: <http://www.chemguide.co.uk/atoms/bonding/electroneg.html>

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