Name _____ Hour _____

Topic 1 - Lesson 4: "Types of Bonds"

Guiding Questions: Use pgs. 38-46

☞ How are electrons involved in bond formation?
☞ What types of bonds between atoms?
☞ How do bonds determine certain properties of compounds?

1. Figure 1 shows fingerprints resulting from cyanoacrylate fuming. What is cyanoacrylate and what elements make it up?

2. What is the reactivity of each element based on?

3. Define component.

4. True or False. Ionic bonding involves a sharing of electrons.

5. An ion is an atom or group of atoms that has either a _____ or _____ charge.

6. Why do atoms so frequently bond with other atoms?

7. Referring to Figure 2, how is the charge on each ion configured? (*Circle all that apply*.)
   a. It is based on the horizontal period the element is located.
   b. It is based on the vertical group the element is located.
   c. The number of protons and electrons is no longer equal.
   d. The number of protons and electrons is equal.

8. Based on the charge numbers given in the table (*as seen in Figure 2*), why is ammonium not in Group 1 on the periodic table?

9. How many valence electrons will a sulfur atom gain? Explain why.

10. Referring to Figure 3 in *Model It!,* why is the potassium atom shown with a positive sign when it has no electrons in its outer shell?

11. When an atom loses an electron, the other atom tends to _____ the electron.

12. In Figure 4, in step 2 – what do the plus and negative charges represent?

13. True or False. Covalent bonds usually form between two nonmetal atoms.

14. Polarity is: (*circle all that apply*)
    a. equal sharing of electrons causes covalently bonded atoms to have slight electric charges on different parts of a molecule.
    b. unequal sharing of electrons causes covalently bonded atoms to have slight electric charges on different parts of a molecule.
    c. the overall molecule still has no charge.
    d. the overall element still has no charge.

15. Referring to Figure 7, why is the iodine molecule not a polar molecule, while hydrogen iodide is?

16. True or False. Water and carbon dioxide both have polar bonds.

17. Why is carbon dioxide not a polar molecule, but water is? (*Circle all that apply*.)
    a. The positive charges are pulled in the same direction on the carbon, canceling each other out.
    b. The positive charges are pulled in opposite directions on the carbon, canceling each other out.
    c. The negative charges are pulled in opposite directions on the carbon, canceling each other out.
    d. The negative charges are pulled in the same direction on the carbon, canceling each other out.

18. In general ionic compounds form _____, _____ crystals that have _____ melting points.

19. True or False. The ions in a solid crystal are loosely bound and cannot move from place to place.

20. Why are melting points relatively low in covalent compounds?

21. Referring to the table in the Math Toolbox on pg. 46, what kind of compound is octane? Circle one below:

Covalent or Ionic