

Bonding WS 1

Name: _____ p. _____

Fill in the following chart:

| Electronegativity Difference | Bond Type | Example |
|------------------------------|-----------|---------|
| | | |
| | | |
| | | |

1) At around which electronegativity (EN) difference do bonds go from covalent to ionic? _____

2) What is the main difference between an ionic bond and a covalent bond?

3) Based on the EN difference, determine which type of bond (ionic or covalent) would exist in each substance listed.

a) NaF _____ b) SO₂ _____ c) PCl₃ _____ d) Rb₂O _____e) NO _____ f) Br₂ _____ g) KI _____ i) ZnF₂ _____

4) IONIC BONDING: Write the correct balanced formulas that would exist between each metal and nonmetal after the electrons are transferred.

Li and Cl

Ba and F

Na and N

K and S

5) Draw a diagram of the crystal lattice of NaCl (2D or 3D if you are inclined):

6) When the following metals oxidize (lose electrons), what will their resulting charge be?

Al _____ Ca _____ Li _____ Be _____ Mg _____

7) When the following nonmetals are reduced (gain electrons), what will their resulting charge be?

I _____ Se _____ P _____ F _____ N _____

8) **Why** do metals tend to lose electrons in ionic bonds, and why do nonmetals gain those electrons?

9a) Diagram the **metallic bonding** (sea of electrons) present in the following metals. Only draw the valence electrons in the diagram.

a) Na

b) Mg

c) Al

9b) Based on your diagram, which metal would have the highest vaporization temperature? Explain your reasoning.

10) Determine the balanced formula of the resulting IONIC compound if the following metal and nonmetal were to bond ionically:

a) Na and F: _____

b) Ca and Br: _____

c) Al and O: _____

d) Sr and P: _____

e) Cs and S: _____

f) Ga and Se: _____

11) Name the above compounds from #10 using ionic naming rules:

a) _____

b) _____

c) _____

d) _____

e) _____

f) _____

12) Covalent compounds are named differently since there are no charged particles to balance. You use the prefix system. Name the following covalent compounds:

a) CO _____

b) N₂O _____

c) NO₂ _____