Chem I Name _____

Date _____ Per _____

Worksheet # C24: Chemical Bonds: Ionic, Covalent, or Polar Covalent?

1. What is electronegativity? _____

_____

2. As you go from left to right on the periodic table does electronegativity increase or decrease? (circle one)

3. As you go down the periodic table, does electronegativity increase or decrease?

4. Looking only at a regular periodic table determine which of the following elements has the greatest electronegativity of each of the following pairs of atoms and circle it.

a. Ba or At b. N or P c. Cl or S d. O or C e. F or Br

5. In general, what two types (metal, nonmetal) of elements form

a. an ionic bond: _____ and _____

b. a covalent bond: _____ and _____

c. a metallic bond: _____ and _____

6. Give three examples of two atom molecules that contain purely covalent bonds:

_____, _____, _____

a. What is the electronegativity difference between atoms with this kind of bonding?

_____

7. What is a polar covalent bond? _____

_____

a. Give an example of a polar covalent bond. _____

b. What is the electronegativity difference between atoms with this kind of bonding?

_____ to _____

8. What is an ionic bond? _____

_____

a. Give an example of an ionic bond. _____

b. What is the electronegativity difference between atoms with this kind of bonding?

_____ to _____

9. What is a metallic bond? _____

_____

The Electronegativities of the Elements (no units! Thank _____ for that.):

H 2.1																		He -----
Li 1.0	Be 1.5												B 2.0	C 2.5	N 3.0	O 3.5	F 4.0	Ne -----
Na 0.9	Mg 1.2												Al 1.5	Si 1.8	P 2.1	S 2.5	Cl 3.0	Ar -----
K 0.8	Ca 1.0		Sc 1.3	Ti 1.5	V 1.6	Cr 1.6	Mn 1.5	Fe 1.8	Co 1.8	Ni 1.8	Cu 1.9	Zn 1.6	Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8	Kr -----
Rb 0.8	Sr 1.0		Y 1.2	Zr 1.4	Nb 1.6	Mo 1.8	Tc 1.9	Ru 2.2	Rh 2.2	Pd 2.2	Ag 1.9	Cd 1.7	In 1.7	Sn 1.8	Sb 1.9	Te 2.1	I 2.5	Xe -----
Cs 0.7	Ba 0.9	*	Lu 1.3	Hf 1.3	Ta 1.5	W 1.7	Re 1.9	Os 2.2	Ir 2.2	Pt 2.2	Au 2.4	Hg 1.9	Tl 1.8	Pb 1.8	Bi 1.9	Po 2.0	At 2.2	Rn -----
Fr 0.7	Ra 0.9	**	Lr -----	Rf -----	Db -----	Sg -----	Bh -----	Hs -----	Mt -----	Ds -----	Rg -----	Uub -----	UUt -----	Uuq -----	Uup -----	Uuh -----	Uus -----	Uuo -----

*	La 1.1	Ce 1.1	Pr 1.1	Nd 1.1	Pm 1.1	Sm 1.2	Eu 1.1	Gd 1.2	Tb 1.1	Dy 1.2	Ho 1.2	Er 1.2	Tm 1.3	Yb 1.1
**	Ac 1.1	Th 1.3	Pa 1.5	U 1.4	Np 1.4	Pu 1.3	Am 1.3	Cm 1.3	Bk 1.3	Cf 1.3	Es 1.3	Fm 1.3	Md 1.3	No 1.3

10. Use the chart above to complete the following table. Use *ionic, covalent*, or *polar covalent* for the bond type.

bonded atoms	electronegativity difference	bond type (ionic, covalent, or polar covalent)	which is the more negative atom?
Ca, Cl			
Fe, F			
P, O			
I, I			
Si, H			
S, F			
Na, Br			

a. The greater the electronegativity difference, the greater the ionic character. Which of the above bonds has the greatest _____ and least _____ ionic character?