Name KEY Date

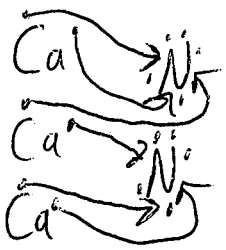
Bonding Test

1. Ionic Bonds result when electrons are transferred between two atoms.
Covalent Bonding result when electrons are shared between two atoms.

2. True or False (Circle one). Covalent bonds take place between a metal and a non-metal while ionic bonds take place between two non-metals.

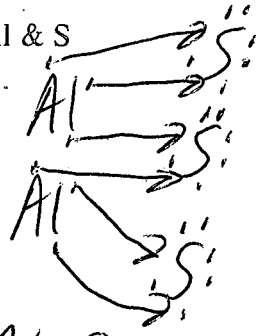
3. Show how the following pairs of elements form ionic compounds (use dot diagrams and arrows). Also write the formula for the ionic compound.

Ca & N



Formula: Ca_3N_2

Al & S



Formula: Al_2S_3

4. A single bond involves 2 electrons. A double bond involves 4 electrons. A triple bond involves 6 electrons. A lone pair of electrons involves 2 electrons. Each type of bond results in 1 electron domain(s). (Each answer is a #)

5. True or False (Circle one). The octet rule states that when atoms participate in covalent bonding they tend to possess 6 electrons. (8)

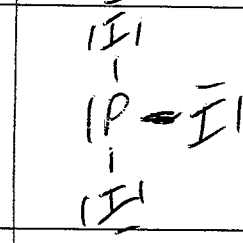
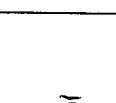
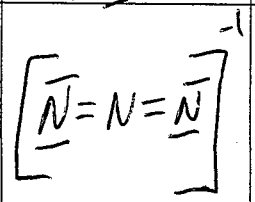
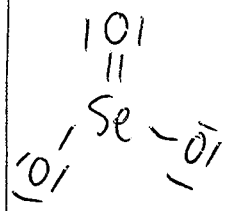
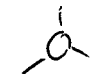
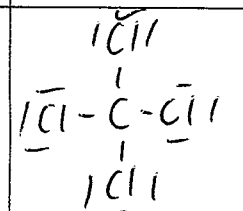
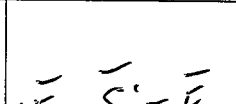
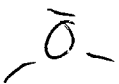
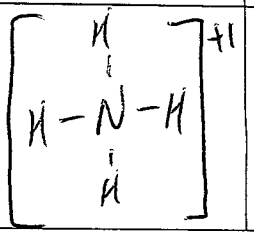
6. Water is a polar molecule. Which atom(s) possesses a partial negative charge (which is more electronegative)?
O - $\delta-$ charge H - partial $\delta+$ charge

7. At room temperature substance A is a gas, substance B is a liquid, and substance C is a solid. Which substance experiences the greater intermolecular forces?
a) Substance A b) Substance B c) Substance C d) Cannot determine

8. If the substances have the same molecular size, which substance is more polar?
a) Substance A b) Substance B c) Substance C d) Cannot determine

9. Using the back of this sheet, count the number of total electrons of the molecule and draw the Lewis structure for the following molecules accurately showing all bonds and lone electron pairs:
PI_3 N_3^{-1} SeO_3 CCl_4 SiF_2

BONUS: NH_4^{+1}

#) Formula	Lewis Structure	Total # of e^- domains	E.D.G. (no pic necessary)	# of bonding domains	# of non-bonding domains	3-D Structure	Molecular Geometry	Approx Bond Angle	Polar Bonds? Dipole Moment? Yes or No?	IMFs Exhibited
PI_3 26e⁻		4	TETRAHEDRAL	3	1		TRIGONAL PYRAMIDAL	107.3°	YES / YES	Dipole-Dipole
N_3^{-1} 16e⁻		2	LINEAR	2	0		LINEAR	180°	NO / NO	IONIC
SeO_3 24e⁻		3		3	0		TRIGONAL PLANAR	120°	YES / NO	LDF
CCl_4 32e⁻		4	TETRAHEDRAL	4	0		TETRAHEDRAL	109.5°	YES / NO	LDF
SiF_2 18e⁻		3	TRIGONAL PLANAR	2	1		BENT	~120°	YES / YES	Dipole-Dipole
NH_4^{+1} 10e⁻		4	TETRAHEDRAL	4	0		TETRAHEDRAL	109.5°	YES / NO	IONIC