MOLECULAR MODEL LAB

Name & Formula	Electro-negativity Difference	Bond Polarity	Drawing of Model	Lewis Structure	Symmetry (Yes/No)	Molecular Polarity	Molecular Shape
hydrogen H_2							
methane CH_4							
ammonia NH_3							
hydrogen bromide HBr							
chloro-methane CH_3Cl							
oxygen O_2							
water H_2O							
carbon dioxide CO_2							
form-aldehyde CH_2O							
phosphorus trichloride PCl_3							

MOLECULAR MODEL KEY:

HYDROGEN = YELLOW NITROGEN = BLUE CHLORINE = GREEN

PHOSPHORUS = BLUE CARBON = BLACK BROMINE = ORANGE

OXYGEN = RED

WOODEN STICKS = SINGLE BONDS METAL SPRINGS = DOUBLE BONDS

MOLECULAR MODEL LAB QUESTIONS:

1.) What shapes of molecules ALWAYS yield polar molecules? Why?

2.) Explain why H_2O is polar and CO_2 is not. Use Lewis structures to answer.

3.) What kind of molecular polarity do you have if the molecule contains only nonpolar bonds? Why?

4.) What shapes are nonpolar molecules? Are these shapes ALWAYS nonpolar molecules? If not, give two examples (chemical formulas) when these shapes are polar molecules.

5.) Explain why chloromethane is not symmetrical and polar. Also, explain why methane is symmetrical and nonpolar. Use Lewis structures to answer.

6.) Fill in the blanks with either "symmetrical" or "not symmetrical".
* Polar molecules are _____.
* Nonpolar molecules are _____.

Atomic #	Element	Electronegativity Value
1	H	2.20
3	Li	0.98
4	Be	1.57
5	B	2.04
6	C	2.55
7	N	3.04
8	O	3.44
9	F	3.98
11	Na	0.93
12	Mg	1.31
13	Al	1.61
14	Si	1.90
15	P	2.19
16	S	2.58
17	Cl	3.16
35	Br	2.96

Problem Set #6

Name:

Date:

Directions - For each of the molecules or ions listed below, draw the Lewis structure, identify the bond polarity between the atoms, molecular polarity of the overall molecule, class, and shape. Additionally, identify the intermolecular forces (IMFs) that would be present between molecules of the compound or ion.

1. NO_2^{-1} (nitrite ion) N - O bonds = Molecular polarity = Class = Shape = IMFs =	2. SeO_3 (selenium trioxide) Se - O bonds = Molecular polarity = Class = Shape = IMFs =
3. H_2O (dihydrogen monoxide) H - O bonds = Molecular polarity = Class = Shape = IMFs =	4. CO_2 (carbon dioxide) C - O bonds = Molecular polarity = Class = Shape = IMFs =
5. TeS_2 (tellurium disulfide) Te - S bonds = Molecular polarity = Class = Shape = IMFs =	6. $SiBr_4$ (silicon tetrabromide) Si - Br bonds = Molecular polarity = Class = Shape = IMFs =

7. NCl_3 (nitrogen trichloride) N - Cl bonds = Molecular polarity = Class = Shape = IMFs =	8. CH_2O (formaldehyde) C - H bonds = C - O bond = Molecular polarity = Class = Shape = IMFs =
9. CH_2Br_2 (dibromomethane) C - H bonds = C - Br bonds = Molecular polarity = Class = Shape = IMFs =	10. PSeBr P - Se bond = P - Br bond = Molecular polarity = Class = Shape = IMFs =