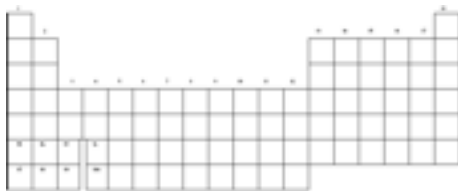


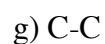
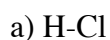
### Electronegativity and Bond Dipole Questions:

1. a) Examine the periodic table and describe or sketch the general trend in electronegativity for atoms.

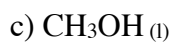
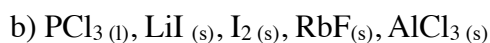
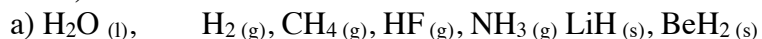


b) What two aspects of atomic structure would explain this trend?

2. Draw the following bonds and label the electronegativity values of each atom. Label the charge ( $\delta^+$  or  $\delta^-$ ) on each atom in the bond (if they exist) and classify the bond as covalent, polar covalent or ionic.



3. Identify the types of bonds in each compound or group of compounds and rank them according to increasing polarity. (State symbols indicate the state each compound is in at room temperature.)



4. i) Draw a Lewis structure for each compound.

ii) Draw and name the molecular shape of the following substances:

- |                      |                     |                     |                                  |
|----------------------|---------------------|---------------------|----------------------------------|
| a) CH <sub>4</sub>   | e) NF <sub>3</sub>  | i) BrF <sub>5</sub> | m) BCl <sub>3</sub>              |
| b) Cl <sub>2</sub> O | f) SiF <sub>4</sub> | j) LiH              | n) MgI <sub>2</sub>              |
| c) BeCl <sub>2</sub> | g) SeF <sub>6</sub> | k) H <sub>2</sub> S | o) NH <sub>4</sub> <sup>+</sup>  |
| d) LiCl              | h) PF <sub>5</sub>  | l) PH <sub>3</sub>  | p) H <sub>3</sub> O <sup>+</sup> |

5. For each of the following molecules:

- Draw the Lewis structure and the molecular shape.
- Indicate the direction of any bond dipoles with vectors.
- Determine if the molecules are polar or non polar

- |                    |                    |                     |                      |
|--------------------|--------------------|---------------------|----------------------|
| a) LiF             | d) Cl <sub>2</sub> | f) BCl <sub>3</sub> | h) BF <sub>2</sub> H |
| b) CH <sub>4</sub> | e) NH <sub>3</sub> | g) BeH <sub>2</sub> | i) SFCl <sub>5</sub> |
| c) HCl             |                    |                     |                      |

6. Which of the following molecules has a molecular dipole?

- |            |            |                         |                          |
|------------|------------|-------------------------|--------------------------|
| a) NaF (g) | b) MgO (g) | c) MgI <sub>2</sub> (g) | d) GaCl <sub>3</sub> (g) |
|------------|------------|-------------------------|--------------------------|