Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block:\_\_\_\_\_ **Molecular Model Lab**

**Pre-Lab:**

1. Electronegativity is the likelihood that a bonded atom will ….
2. How are electronegativity values used to determine bond polarity?
3. Describe a polar bond.
4. Describe a nonpolar bond.
5. **δ- /δ+** are used only in what kind of bond?
6. How is it determined which atom gets **δ-** sign?
7. Explain the relationship between **δ-** charge, electron density, and the strength of the atom who has **δ-** charge.
8. Explain the main concept behind the VSEPR theory of molecular shape. How do both *number* and *type* of electron pairs influence the shape of a molecule?

**Procedures:**

1. Determine the molecular name for each substance.
2. Draw the lewis structure for each molecule.
3. Construct the molecule using the molecular model kit.
4. Draw the constructed model.
5. Determine the VSEPR shape and record the name.
6. Determine the bond polarity, molecular polarity, and intermolecular force for each.
7. Lastly, determine if the molecule will dissolve in water.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name each molecular formula** | **Lewis**  **Structure** | **Draw the constructed model of the molecule**  *(when applicable add***δ+** and **δ-***onto atoms)* | **Name of VSEPR Shape** | **Bond Polarity** | **Molecular Polarity** | **IMF** | **Does this molecule dissolve in water?** |
| H2O  **Name:** |  |  |  |  |  |  |  |
| BrCl  **Name:** |  |  |  |  |  |  |  |
| SiO2  **Name:** |  |  |  |  |  |  |  |
| NH3  **name:**  *Ammonia*  or |  |  |  |  |  |  |  |
| **Name each molecular formula** | **Lewis**  **Structure** | **Draw model of the molecule**  *(add***δ+** and **δ-***onto atoms when applicable)* | **Name of VSEPR Shape** | **Bond Polarity** | **Molecular Polarity** | **IMF** | **Does this molecule dissolve in water?** |
| PH3  **Name:** |  |  |  |  |  |  |  |
| CH4  **Name:** |  |  |  |  |  |  |  |
| CH3Cl  *methyl chloride* |  |  |  |  |  |  |  |
| CH2O  *Formaldehyde* |  |  |  |  |  |  |  |

**Post-Lab Questions:**

1. Why is a water molecule “bent” ?
2. Explain how you were able to determine molecular polarity. What factors did you need to consider?
3. Intermolecular forces are attractions between…
4. Hydrogen bonding is the attraction between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on one molecule and either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_ on another molecule.
5. Dipole-Dipole is the attraction between the \_\_\_\_\_\_\_\_\_\_ on one molecule and the \_\_\_\_\_\_\_\_\_\_\_\_ of another molecule. It only occurs with \_\_\_\_\_\_\_\_\_\_\_\_ molecules.
6. Explain London dispersion force and which type of molecules it occurs between.
7. How can understanding intermolecular forces help predict high boiling/melting points?
8. Which two molecules in today’s lab have the highest boiling/melting points?