**Pre-Lab Model Molecular Shape: mini-lab 9.2**

**Purpose:** To investigate the three-dimensional shape of molecules by building models

**Question:** What shapes will be formed because of electron repulsion in these molecules?

**Background information:**

* The geometry or shape which allows the electrons to be the farthest away from each other is the shape of the compound
* The shape which minimizes the repulsive force between electrons will be formed
* Non-bonded pairs are more repulsive than bonded pairs so take up more “space” around the atom

***Students will complete the pre-lab table and construct their Claim/Hypothesis***

|  |  |  |
| --- | --- | --- |
| **Formula** | **Dot Diagram** | **Predicted Geometry** |
| H2 |  |  |
| HCl |  |  |
| H2O |  |  |
| CO2 |  |  |
| NH3 |  |  |
| CH4 |  |  |
| C2 H6 |  |  |
| C2H4 |  |  |
| C2H2 |  |  |

**Claim/Hypothesis**

|  |
| --- |
|  |

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**Procedure:**

* Obtain a model kit
* Using the dot diagrams from your pre-lab and your knowledge of electron repulsion and the role it plays in molecular structure, **build a model of each of the following molecules**
* After building the model, **sketch the molecular shape and identify the structural geometry** and angles which are distorted in the following table.
* **Complete the analysis questions** on a separate piece of paper.
* **Complete a Conclusion** evaluating your hypothesis, based on your observations

***Complete the table based on your observation***

|  |  |  |  |
| --- | --- | --- | --- |
| **Formula** | **# of**  **Electron Domains** | **Sketch of shape** | **Observed Geometry** |
| H2 |  |  |  |
| HCl  **Formula** | **# of**  **Electron Domains** | **Sketch of shape** | **Observed Geometry** |
| H2O |  |  |  |
| CO2 |  |  |  |
| NH3 |  |  |  |
| CH4  **Formula** | **# of**  **Electron Domains** | **Sketch of shape** | **Observed Geometry** |
| C2 H6 |  |  |  |
| C2H4 |  |  |  |
| C2H2 |  |  |  |

**Analysis and Conclusions:**

1. How did the Lewis dot diagram of each molecule help you predict its geometry?
2. What do your results show you about the impact of electrons on geometric shape?
3. What is the relationship between the number of electron domains and molecular geometry?
4. Was your hypothesis supported by your observations? Why or Why not?
5. What is the next question you would like to explore about molecular geometry?

**Complete your lab write up and hand it in by the end of the week!**