Stereochemistry Lab Chemistry 20

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Partner \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Purpose**: To use the VSEPR theory to predict shapes around central atoms of molecular compounds & polyatomic ions

**Procedure:**

Use the model kits provided to build 3-D models of the following molecular compounds.

Fill in all the missing areas of the observation table. Your text book may be of help. (See pages 85 🡪 112)

**Observations**: Enlarge this chart and fill in all spaces. (2 marks per line) (1/2 mark will be subtracted for every error per line)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Empirical formula / Molecular formula | Lewis Diagram | Stereo-chemical formula |  | Central Atom(s) – lone pairs | Central Atoms(s) – bonding e- | shape(s) around each central atom | Bond dipoles | Polar or Non-polar |
| 1 | NH3(s) |  |  |  |  |  |  |  |  |
| 2 | C2Cl4(g) |  |  |  |  |  |  |  |  |
|  | Empirical formula / Molecular formula | Lewis Diagram | Stereo-chemical formula |  | Central Atom(s) – lone pairs | Central Atoms(s) – bonding e- | shape(s) around each central atom | Bond dipoles | Polar or Non-polar |
| 3 | CF4(g) |  |  |  |  |  |  |  |  |
| 4 | OCl2(g) |  |  |  |  |  |  |  |  |
| 5 | C2F2(g) |  |  |  |  |  |  |  |  |
| 6 | HOF(l) |  |  |  |  |  |  |  |  |
|  | Empirical formula / Molecular formula | Lewis Diagram | Stereo-chemical formula |  | Central Atom(s) – lone pairs | Central Atoms(s) – bonding e- | shape(s) around each central atom | Bond dipoles | Polar or Non-polar |
| 7 | NHF2(g) |  |  |  |  |  |  |  |  |
| 8 | C2IBr(l) |  |  |  |  |  |  |  |  |
| 9 | CHClBr2(l) |  |  |  |  |  |  |  |  |
| 10 | C2HF3(l) |  |  |  |  |  |  |  |  |
|  | Empirical formula / Molecular formula | Lewis Diagram | Stereo-chemical formula |  | Central Atom(s) – lone pairs | Central Atoms(s) – bonding e- | shape(s) around each central atom | Bond dipoles | Polar or Non-polar |
| 11 | H2O2(l) |  |  |  |  |  |  |  |  |
| 12 | CO2(g) |  |  |  |  |  |  |  |  |
| 13 | N2H3F(g) |  |  |  |  |  |  |  |  |
| 14 | C2H5OH(l) |  |  |  |  |  |  |  |  |
|  | Empirical formula / Molecular formula | Lewis Diagram | Stereo-chemical formula |  | Central Atom(s) – lone pairs | Central Atoms(s) – bonding e- | shape(s) around each central atom | Bond dipoles | Polar or Non-polar |
| 15 | NH4+ (aq) |  |  |  |  |  |  |  |  |
| 16 | CO32-(aq) |  |  |  |  |  |  |  |  |
| 17 | NO3-(aq) |  |  |  |  |  |  |  |  |

1. Identify molecules (compounds or polyatomic ions) with multiple bonds:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Multiple bonds make the reagent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(more or less) stable
* Multiple bonds bring the atoms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (closer or further) apart

2. Identify the molecules with coordinate covalent bonds.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Based on given states, which molecules have the strongest bonds? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Based on given states, which molecules have the weakest bonds? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Do questions 9, 10, and 11 from pages 100 🡪 101 of your text. (Attach a piece of paper please)

6. Glucose has MANY isomers. Sketch three different line diagrams for glucose.