

Name _____

EXPERIMENT 15: REPORT

MOLECULAR MODELS

Section _____

Procedure

In the table below are a series of molecules or ions. You are to make a model of each using the model kit. Your instructor will show you how the model kit is to be used. Once the model is made, you will analyze its structure and fill in the table with the following information:

1. Indicate number of valence electrons and draw the Lewis structure. If there are resonance structures, include only one.
2. Draw the VSEPR structure and name the geometry of the electron regions
3. Name the molecular geometry and approximate bond angles.
4. Draw the VSEPR structure again, indicating the polarity of the bonds with arrows by considering the relative electronegativities of the atoms.
5. Is the molecule or ion polar overall, yes or no?
6. *An example showing NH₃ is shown in the first set of boxes. Refer to the introduction for more info on NH₃.*

Molecule or ion	Number of Valence electrons; Lewis structure	VSEPR structure (AB _x E _y); geometry of electrons	Molecular Geometry; bond angles	VSEPR structure with bond polarities	Polar overall, yes or no?
NH ₃ example	8 $\begin{array}{c} \text{H} \\ \\ \text{:N-H} \\ \\ \text{H} \end{array}$	AB ₃ E ₁ - total of 4 regions = tetrahedral $\begin{array}{c} \cdot\cdot \\ \diagup \text{N} \diagdown \\ \text{H} \quad \quad \text{H} \\ \quad \text{H} \end{array}$	trigonal pyramid < 109°		Yes
H ₂ O					

AlF₃					
SiCl₄					
H₃O⁺					

CH₂Cl₂					
NO₂⁻					
IO₂⁻					
SCN⁻ (C is the central atom)					

PO₃³⁻					
SO₃²⁻					
CH₂O (formal- dehyde)					
O₃ (ozone)					

N_3^- (azide ion)					
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Discovery Question: draw all possible Lewis formulas of $\text{C}_2\text{H}_2\text{Cl}_2$ (the two C atoms are central). You may find “isomers”. How are these structures different? Examine models. Predict whether each of the structures will have a molecular polarity.