

VSEPR-AXE Molecule Model Activity

Understanding the shape of molecules

Beals Chemistry

On a new piece of paper with a heading, complete all of the following as an assignment:

Part A: Review

1. Define and explain "VSEPR".
2. What is the AXE Method (see below for a hint)

AXE Method

The "AXE Method" is a simple way to determine the molecular geometry of a molecule after you've drawn the Lewis Structure for the molecule

A = central atom

X = atom bonded to A

E = a lone pair on A

Part B: Building Models with MolyMod Kits

You will be using the MolyMod Kits to build 3-D structures of molecules.

**Note: There are two bonding types in the MolyMod kits. The shorter bonds are for single bonds (Sigma Bonds), the longer more bendable bonds are used when double or triple bonds occur (Pi Bonds).*

Instructions

****Draw a data table similar to the one below.**

1. **Name:** Write the molecule name
2. **Lewis Structure:** Draw the correct Lewis Structure (Show your work in calculating the number of electrons available)
3. **AXE Formula:** Write the AXE Formula (See VSEPR Theory 'Cheat sheet')
 - a. **Build the structure with the MolyMod Kit.** Use correct colors and bonds (see instruction manual inside bag for color code)
4. **Molecular Shape:** Write the name of the molecular shape
5. **Bond Angles:** Write the angle of the Bonds
6. **3D Drawing:** Go to the [VSEPR Simulation](#) website
 - a. Click on "Model Molecule"
 - b. Build the molecule in the simulator
 - c. Draw a 3D representation of the molecule in the box provided.

Example table

Molecule	Name	Lewis Structure	AXE Formula (Build MolyMod)	Molecular Shape	Bond Angles	3D Drawing (See Instructions)	
H ₂	Hydrogen gas						
CO ₂							
CO							
H ₂ CO	Formaldehyde						
CH ₄	Methane						
NH ₃							
H ₂ O							
*PCl ₅							
*SF ₆							
*XeF ₄							

*Will not be able to build a MolyMod model of these as they have expanded octets and are exceptions to the octet rule