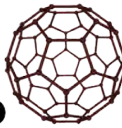


Goodie bag #4: VSEPR

Handed out on 9.28.18 | Quiz #4 on 10.11.18

Please treat all contents of every Goodie Bag with care, and be cognizant that any item may be dangerous if improperly used. You are responsible for your own actions. Make sure to carry out any activities with items in this bag in an appropriate environment.

3. 
9 1

Do yourself a solid.

This bag contains:

- 1 colorful "VSEPR Theory Basic Molecular Models Kit"



In this GB, please do NOT refer to the part description included in the kit when building models. For example, you can use the "Carbon Tetrahedral Black" part for any tetrahedral atom, not just Carbon.

What to bring to the quiz: the colorful VSEPR kit

Introduction:

This goodie bag will explore the 3D shape of molecules using the VSEPR theory. Core knowledge and practice: Lewis structure, VSEPR theory, hybridization.

Instructions & Questions

Question 1:

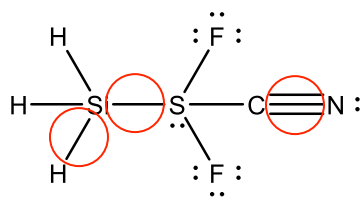
- a) Write down the Lewis structure of $\text{H}_3\text{Si-SF}_2\text{-CN}$.

b) Determine the molecular geometry of the Si, S and C atoms in this molecule.

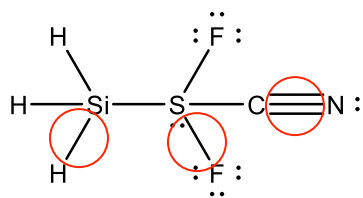
c) Create a model of this molecule using the kit.
Do not take into account the part description.

d) Can the 3 bonds circled below be in the same plane?

i)



ii)



Question 2:

a) Write down the Lewis structure of the $\text{Cl}_2\text{HC-BH-OH}$ molecule.

b) Determine the molecular geometry of the C, B and O atoms in this molecule.

c) Create a model of this molecule using the kit.

d) Notice that the C-B bond can rotate, resulting in the O being spatially closer to either one of the Chlorine atoms attached to the Carbon, or to the Hydrogen atom attached to the Carbon. Which position is the configuration with lower energy?

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3.091 Introduction to Solid-State Chemistry
Fall 2018

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