

IMF Unit – Lewis Structure, VSEPR Theory, VB Hybridization, MO Theory

Fill in the chart below.

Molecule	C ₂	O ₂	HF	SeCl ₄
Lewis Structure				
VSEPR: Electronic geometry of central atom(s)?				
VSEPR: Molecular geometry of central atom(s)?				
Is the molecule polar?				
What is the predominate IMF?				
VB: What types of bonds are in the molecule? What atomic and/or hybrid orbitals make up each bond?				
MO: Find the MO diagram for the molecule in a book or on the website and fill it in.			The MO diagram for this molecule is more complicated and goes beyond the scope of the class. See this website for more info. http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html	The MO diagram for this molecule is more complicated and goes beyond the scope of the class. See this website for more info. http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html
What is the bond order? Does it correspond to what you found in the Lewis structure and VB analysis?				
Diamagnetic or Paramagnetic?				

Fill in the chart below.

Molecule	methane	ethene	ethyne	4-aminobenzoic acid
Lewis Structure				(Look it up!)
VSEPR: Electronic geometry of central atom(s)?				
VSEPR: Molecular geometry of central atom(s)?				
Is the molecule polar?				
What is the predominate IMF?				
VB: What types of bonds are in the molecule? What atomic and/or hybrid orbitals make up each bond?				
MO: Find the MO diagram for the molecule in a book or on the website and fill it in.		The MO diagram for this molecule is more complicated and goes beyond the scope of the class. See this website for more info. http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html	The MO diagram for this molecule is more complicated and goes beyond the scope of the class. See this website for more info. http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html	The MO diagram for this molecule is more complicated and goes beyond the scope of the class. See this website for more info. http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html
What is the bond order? Does it correspond to what you found in the Lewis structure and VB analysis?				
Diamagnetic or Paramagnetic?				

The HOMO-LUMO gap of a molecule is equal to $\Delta E = 2 \text{ eV}$. What wavelength of electromagnetic radiation do you expect it to absorb?

A molecule absorbs light of $\lambda = 490 \text{ nm}$. What do you predict is the HOMO-LUMO gap of that molecule?