CH301 LaBrake and Vanden Bout

Lewis Structure, VSEPR Theory, VB Hybridization, and MO Theory

Fill in the Chart below.

Molecule	C2	O2	HF	SeCl4
Lewis Structure				
VSEPR: Electronic geometry of the central atom(s)?				
VSEPR: Molecular geometry of the central atom(s)?				
Is the molecule polar?				
What is the predominate IMF for this molecule?				
VB: What type of bonds are in the molecule? What atomic and/or hybrid orbitals make up each of these bonds?				
MO: Find the MO diagram for the molecule in the book or the website and fill it in?			The MO diagram for this molecule is more complicated and goes beyond the scope of this class. Look out for it in Inorganic Chemistry or see this website for more information 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 this class. Look out for it in Inorganic Chemistry or see this website for more information http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html.
What is the bond order of the molecule? Does it correspond to what you found in the Lewis Structure and VB analysis?				
Is the molecule diamagnetic or paramagnetic?				

Molecule	methane	ethene	ethyne	4-aminobenzoic acid
Lewis Structure				Look up the structure on the internet. We do NOT expect you to know this off the top of your head.
VSEPR: Electronic geometry of the central atom(s)?				
VSEPR: Molecular geometry of the central atom(s)?				
Is the molecule polar?				
What is the predominate IMF for this molecule?				
VB: What type of bonds are in the molecule? What atomic and/or hybrid orbitals make up each of these bonds?				
MO: Find the MO diagram for the molecule in the book or the website and fill it in?		The MO diagram for this molecule is more complicated and goes beyond the scope of this class. Look out for it in Inorganic Chemistry or see this website for more information 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 this class. Look out for it in Inorganic Chemistry or see this website for more information 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 this class. Look out for it in Inorganic Chemistry or see this website for more information http://www.ch.ic.ac.uk/vchemlib/course/mo_theory/main.html.
What is the bond order of the molecule? Does it correspond to what you found in the Lewis Structure and VB analysis?				
Is the molecule diamagnetic or paramagnetic?				

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

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