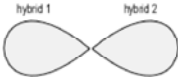
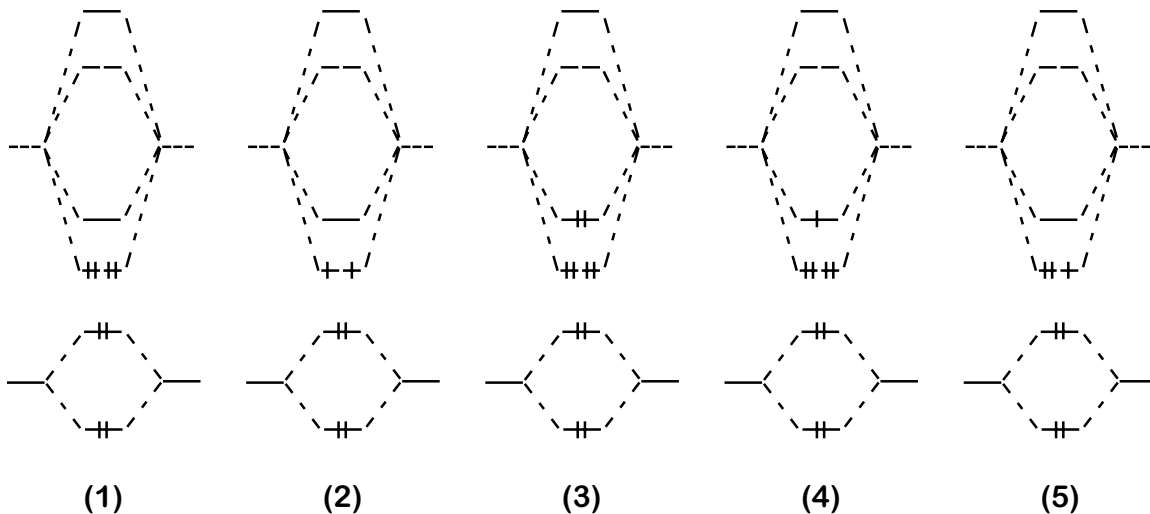


10. Draw the Lewis structure for IF_5 . The molecular geometry is:
- 1) square planar 2) square pyramidal 3) trigonal bipyramidal
4) octahedral 5) none of the above
11. The molecule IF_5 is:
- 1) polar 2) nonpolar 3) can't tell
12. In IF_5 , what is the hybridization on **I**?
- 1) sp^3d^3 2) sp^3d^2 3) sp^3d 4) sp^3 5) sp^2
13. The picture at right depicts which type of orbital hybridization?
- 1) sp 2) sp^2 3) sp^3 4) sp^4 5) none of the above
- 
14. In the orbital hybridization *above*, how many atomic orbitals were used to create the resulting molecular orbitals?
- 1) 1 2) 2 3) 3 4) 4 5) 5
15. A molecule has sp^3d hybridization with one lone pair. The **electron pair geometry** of this molecule is:
- 1) tetrahedral 2) octahedral 3) linear
4) square pyramidal 5) trigonal bipyramidal
16. What hybrid orbitals make up the sigma bond between **C1** and **C2** in propylene, CH_2CHCH_3 ?
- 1) sp & sp^3 2) sp & sp^2 3) sp^2 & sp^3 4) sp^2 & sp^2 5) sp^3 & sp^3

17. Which of the following molecular orbital representations correctly describes N_2^+ ?



18. From molecular orbital theory, the bond order in N_2^+ is:

- 1) single 2) double 3) 0.5 4) 1.5 5) 2.5

19. Consider the molecular orbital diagram shown at right:

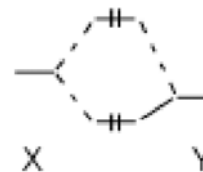
This energy diagram best describes:

- 1) O_2 2) NO^- 3) NO^+ 4) N_2



20. In the diagram at right, the π bonding orbitals are best described as:

- 1) all O 2) all N
 3) more O than N 4) more N than O
 5) equal mixture of O and N



21. Using molecular orbital theory, what is the bond order in the anion N_2^+ ?

- 1) 1 2) 1.5 3) 2 4) 2.5 5) 3

Solubility Rules for some ionic compounds in water

Soluble Ionic Compounds

1. All sodium (Na^+), potassium (K^+), and ammonium (NH_4^+) salts are SOLUBLE.
2. All nitrate (NO_3^-), acetate (CH_3CO_2^-), chlorate (ClO_3^-), and perchlorate (ClO_4^-) salts are SOLUBLE.
3. All chloride (Cl^-), bromide (Br^-), and iodide (I^-) salts are SOLUBLE -- EXCEPT those also containing: lead, silver, or mercury (I) (Pb^{2+} , Ag^+ , Hg_2^{2+}) which are NOT soluble.
4. All sulfate (SO_4^{2-}) salts are SOLUBLE -- EXCEPT those also containing: calcium, silver, mercury (I), strontium, barium, or lead (Ca^{2+} , Ag^+ , Hg_2^{2+} , Sr^{2+} , Ba^{2+} , Pb^{2+}) which are NOT soluble.

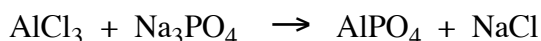
Not Soluble Ionic Compounds

5. Hydroxide (OH^-) and oxide (O^{2-}) compounds are NOT SOLUBLE -- EXCEPT those also containing: sodium, potassium, or barium (Na^+ , K^+ , Ba^{2+}) which are soluble.
6. Sulfide (S^{2-}) salts are NOT SOLUBLE -- EXCEPT those also containing: sodium, potassium, ammonium, or barium (Na^+ , K^+ , NH_4^+ , Ba^{2+}) which are soluble.
7. Carbonate (CO_3^{2-}) and phosphate (PO_4^{3-}) salts are NOT SOLUBLE -- EXCEPT those also containing: sodium, potassium, or ammonium (Na^+ , K^+ , NH_4^+), which are soluble.

22. Mixing Na_2CO_3 with KCl in water leads to precipitation of:

- 1) a CO_3^{2-} salt 2) a Na^+ salt 3) a Cl^- salt
 4) everything precipitates 5) no precipitation

23. Write the balanced, *net ionic equation* corresponding to the unbalanced equation:



The coefficient in front of Na^+ (aq) is:

- 1) 1 2) 2 3) 3 4) 4
 5) 0 (Na^+ doesn't occur in the net ionic equation)

