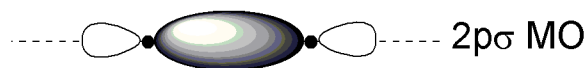


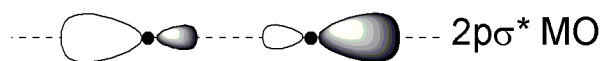
PS #5 Practice Questions – Constructing Molecular Orbitals, Nucleophilic Attack on Carbonyl Groups

Part I. Molecular orbitals (MO's). Refer to pages 95 – 110 in Clayden and Greeves.

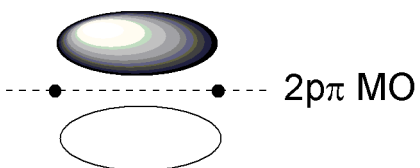
Draw the σ (**bonding**) MO that arises from the linear combination of two p orbitals.



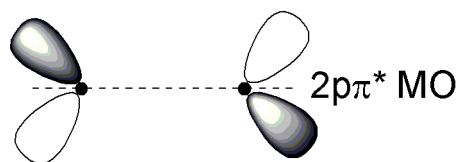
Draw the σ^* (**antibonding**) MO that arises from the linear combination of two p orbitals.



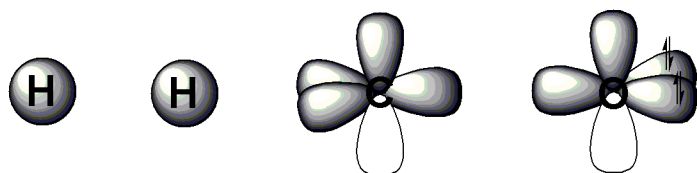
Draw the π (**bonding**) MO that arises from the linear combination of two p orbitals.



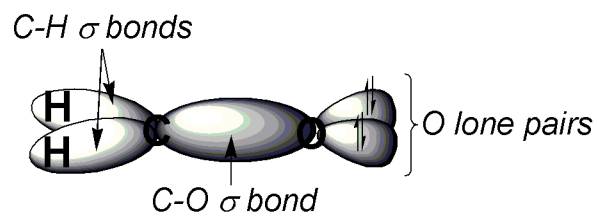
Draw the π^* (**antibonding**) MO that arises from the linear combination of two p orbitals.



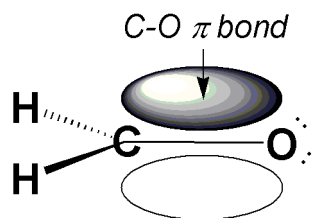
Construct the σ and π system of formaldehyde (H_2CO).



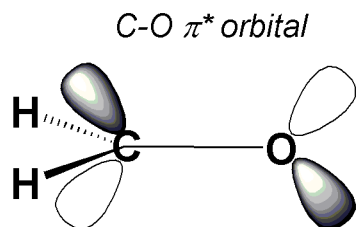
Have 2 H with 1s orbitals, the C and O are sp² hybridized.
Combine the sp² orbitals and H s orbitals to form the σ system.



Combine the p orbitals to form the π system.



Show the π^* bond on C-O in formaldehyde.



Part II. All of the following reactions involve nucleophilic attack on the electrophilic carbonyl carbon. Fill in the boxes with the appropriate product or reagent.

