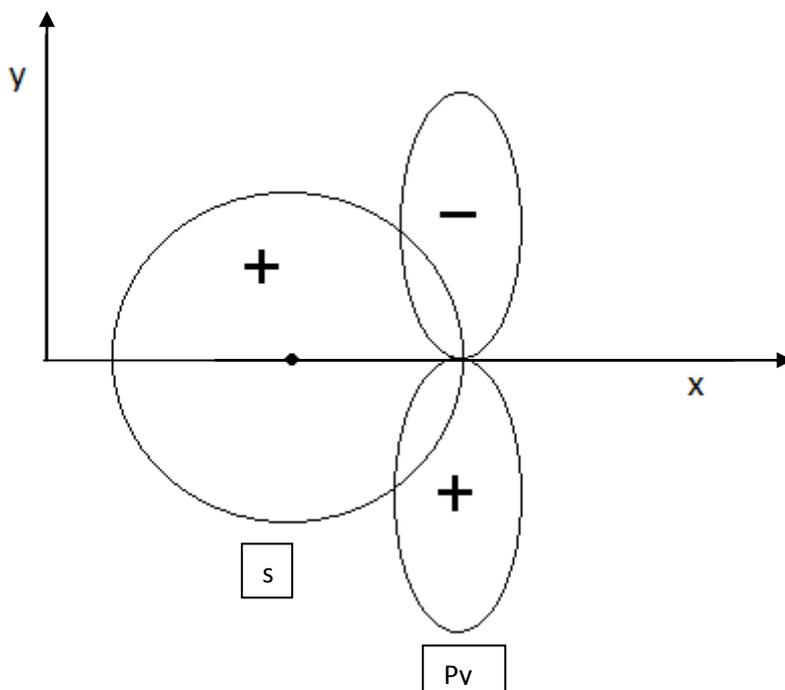


## Answer on Question #77129, Chemistry / Inorganic Chemistry

Draw a properly labelled (axes and signs) diagram of the molecular orbital obtained by the combination of s-orbital with  $p_y$  orbital along x axis. Is this orbital bonding, antibonding or non-bonding ?

Solution



Interaction between atomic orbitals leads to formation of bond if the orbitals:

- 1) Are of the same molecular symmetry
- 2) Can overlap well
- 3) Are of similar energy.

We can see from the diagram that s and  $p_y$  orbitals are of wrong symmetry (there is no cylindrical symmetry of electron density along intermolecular axis x for  $p_y$  orbital.) No net overlap of s and  $p_y$  orbitals: constructive part = destructive part, consequently this molecular orbital is nonbonding (NBMO).

