

chapter 6

valence bond theory and molecular orbital theory

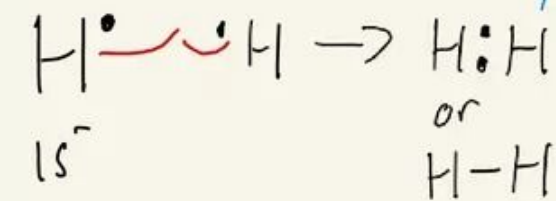
- bring QM back into the picture to understand bonding

valence bond theory: easier to do with pen and paper
• hybrid approach that adds orbitals to Lewis structures
"hybridization"

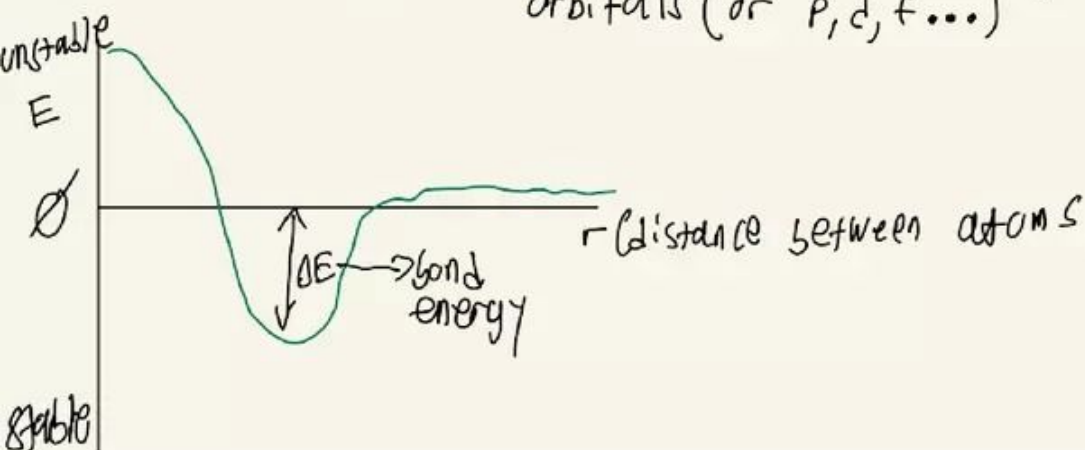
molecular orbital theory: Apply the Schrodinger's equation to a whole molecule. This is the result
Get molecular orbital

more accurate

valence bond theory:

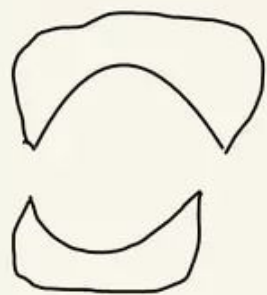


sigma (σ) orbital: a bonding orbital, forms using s orbitals (or p, d, f...)



p orbitals: make σ or π bonds

π bond: 2 lobes overlap



π bond



σ bond

σ bonds are usually more stronger (lower energy) than π bonds

hybridization:

note that p orbitals are off 90° apart