Quiz 9.3 – Molecular Orbital Theory: Polyatomic Molecules

Name: _____

Resonance in 1,3,5 hexatriene

○ Show the Hückel theory determinant for 1,3,5 hexatriene. You may either show the matrix populated with α and β terms, or the simplified matrix with only 1s and 0s

○ Solve for the energy levels (You may use WolframAlpha or similar software to either find the determinant or diagonalize the matrix) and draw the energy level diagram

○ Give the total bonding energy of the π system, as well as the resonance stabilization energy

Resonance in benzene

○ Show the Hückel theory determinant for benzene. You may either show the matrix populated with α and β terms, or the simplified matrix with only 1s and 0s

○ Solve for the energy levels (You may use WolframAlpha or similar software to either find the determinant or diagonalize the matrix) and draw the energy level diagram

○ Give the total bonding energy of the π system, as well as the resonance stabilization energy

○ Compare these values to those found for 1,3,5 hexatriene and comment on why they are different