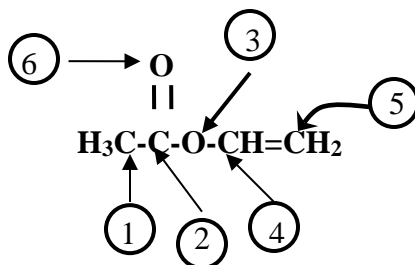


Chemistry 1B-AL

Homework #7 (#50-#54, S14-S15))

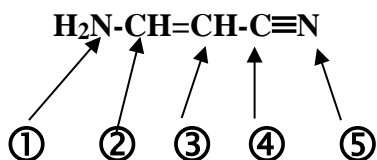
Required (submit via [WebAssign](#))

50. For the molecule below:



- a. What is the hybridization of:
- C1
 - C2
 - O3
 - C4
 - C5
 - O6
- b. What is the geometry around
- C1
 - C2
 - O3
 - C4
 - C5
- c. What a.o.'s or hybrids comprise the following bonds or non-bonding pairs?
- C1-H
 - C5-H
 - C2-O3
 - C4-C5 (both bonds)
 - C2-O6 (both bonds)
 - lone pairs on O3
- d. What are the bond angles for
- H-C1-C2
 - C1-C2-O6
 - C2-O3-C4
 - H-C5-H

51. For the following molecule:



- a. What is the hybridization at:
- N1
 - C3
 - C4
 - N5
- b. What are the bond angles:
- H-N1-H
 - H-C3-C4
 - C3-C4-N5
- c. What hybrids or ao's constitute the C4-N5 bonds (all 3)?
52. Draw the molecular structures for each of the following and state whether they would or would not have a dipole moment:
- 1,1 dichloroethylene Cl_2CCH_2
 - 1,1 dichloroethane HCl_2CCH_3
 - trans* 1,2 dichloroethylene HCICCHCl
 - cis* 1,2 dichloroethylene HCICCHCl
 - trans* 1,2 chlorofluoroethylene HCICCHF
53. Zumdahl #14.14
54. Zumdahl #14.27

Section

S14. Advantages/disadvantages of orbital hybridization

- What are the energetic DISADVANTAGES of hybridization?
- What are the energetic ADVANTAGES of orbital hybridization?

S15. Why is there free rotation allowed around a single $\text{C}-\text{C}$ bond but not around a $\text{C}=\text{C}$ double bond?