

WEBCT ASSIGNMENT QUESTIONS – 9/5/03

- A. Rank the following acids in the order from weakest acid to strongest acid and justify your rankings: protonated acetone (C_3H_7O), protonated N,N-dimethylacetamide ($C_4H_{10}NO$), protonated methyl acetate ($C_3H_7O_2$).
- B. Predict the position of the substituents (axial/equatorial) in the lowest energy conformation for (*1R, 3S, 4R, 6S*)-4,6-Dimethylcyclohexan-1,3-diol. Rationalize your answer.
- C. Describe why one of two possible products in the addition of hydrobromic acid to the double bond of 2-methyl-2-butene is much more favored to be the majority product than the other.
- D. List and describe the similarities and differences between a nucleophile and a base.
- E. List and describe the similarities and differences between an electrophile and an acid.
- F. List and describe the similarities and differences between a carbocation, a carbanion, and a radical.
- G. Define and describe hybridization and its effect on structure and reactivity.
- H. As thoroughly as you can, describe the differences between equilibrium and resonance.
- I. Discuss the relationship between electronegativity and the stability of charged species in solution. Talk about any two examples of this relationship that you wish.
- J. Discuss the similarities and differences between thermodynamic products and kinetic products. When can they be one and the same?
- K. Compare and contrast the properties of transition states vs. intermediates.
- L. Describe the differences between configuration and conformation. Discuss specific molecules to illustrate your points.
- M. Is methyl radical planar or pyramidal? Justify your answer.
- N. Is the nitrogen atom of the molecule aniline planar or pyramidal? How would you determine the geometry? Describe its hybridization.