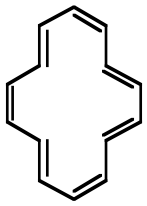
Aromaticity Problem Set #1
Due at the end of lecture on 1/29/2003
No late homeworks accepted

❖ For Chapter 15, read pages 559 –582

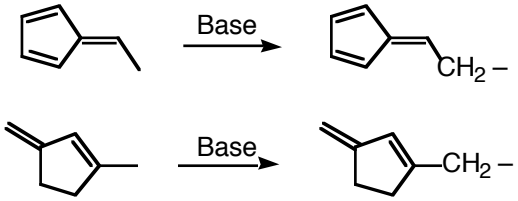
Excercises:
❖ McMurry 5th Ed Problems: 15.3, 15.5, 15.7, 15.14, 15.29, 15.32.

❖ Additions Problems:
(1) Shown below is [14]-Annulene. Is it aromatic? It has only two 1H-NMR resonances: one at 0 ppm and another at 7.6 ppm. Explain these two wildly different values. What is the ratio of these two resonances?

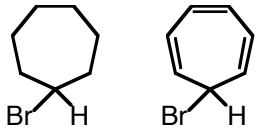


[14]-Annulene

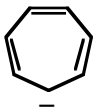
(2) Draw resonance structures for each of the deprotonated compounds on the right. Which of compounds on the left would you expect to be more acidic and why?



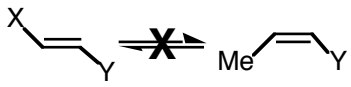
(3) The compound on the left is soluble in nonpolar solvents like diethyl ether while the compound on the right is <u>insoluble</u> in these solvents and miscible with water? Explain.

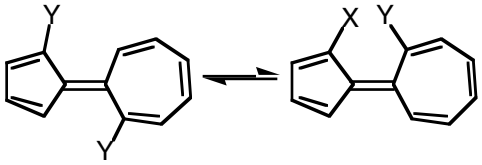


(4) Draw resonance structures for the anion shown below. With this many structures why is it not so stable?

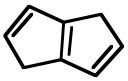


(5) Explain *both* why the left equilibrium does not occur and why the right equilibrium does occur.

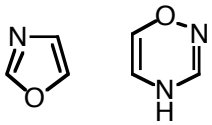




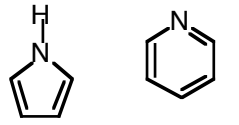
(6) The molecule below can be doubly deprotonated. Draw the structure of the dianion. Would you consider this to be aromatic?



(7) Are the two heterocycles shown below aromatic?



(8) Describe the orbitals of the nitrogen atoms in the structures below. Which nitrogen is more basic and why?



(9) Draw the products for the following two reactions. Why does anthracene undergo this reaction and benzene does not?