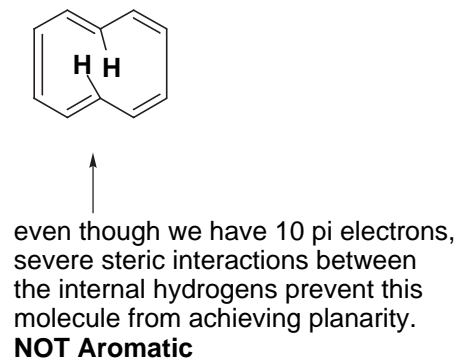
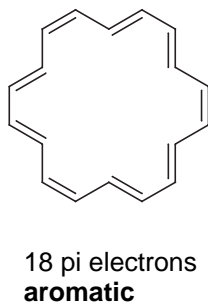
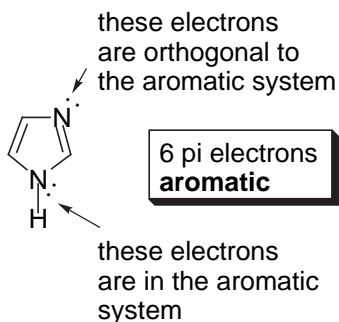
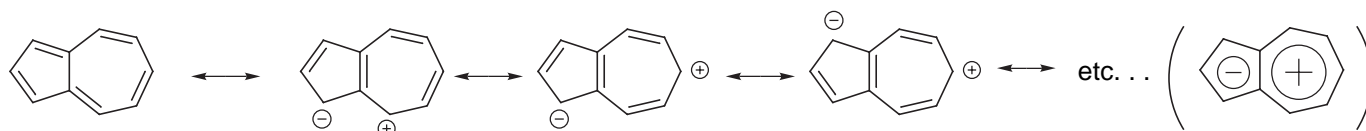


Chem 332, Spring 2003, Professor Fox, Practice questions for exam 3

1. Indicate if the following molecules are aromatic

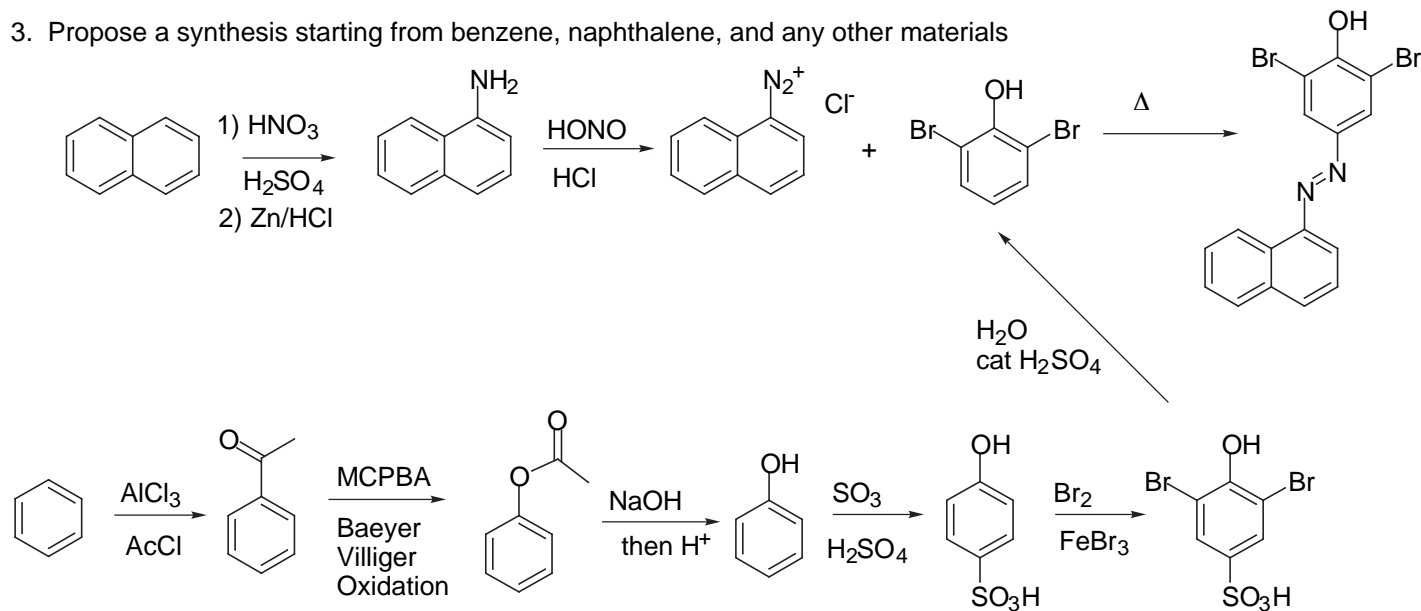


2. Azulene has an unusually large dipole for an organic hydrocarbon. Explain why.

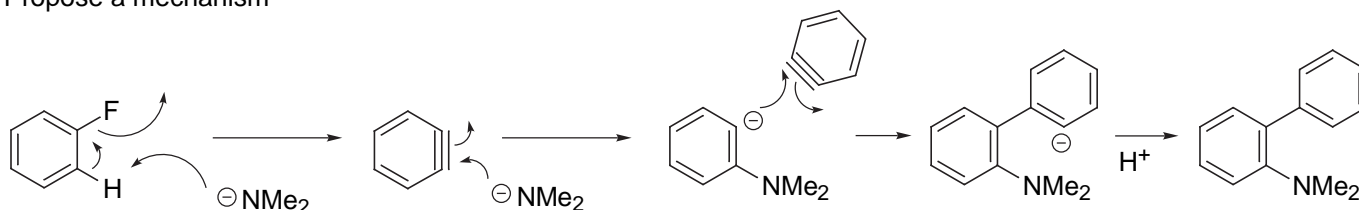


for azulene, we can draw numerous resonance forms in which both ends of the molecule are aromatic (cyclopentadienyl anion on the left; tropylium cation on the right). Delocalized aromatic molecules of this type are often depicted by drawing a circle with the charge in the center (see above).

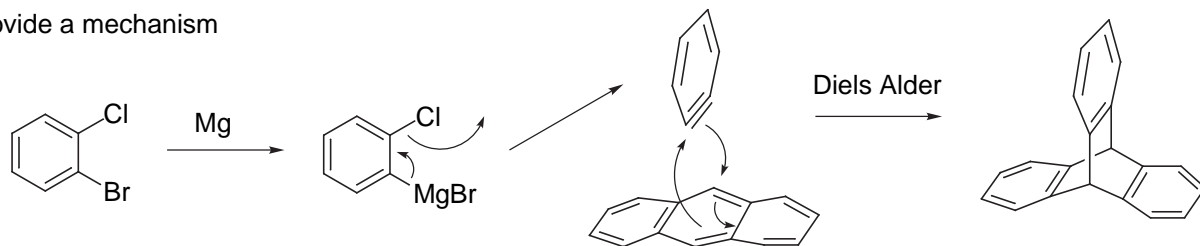
3. Propose a synthesis starting from benzene, naphthalene, and any other materials



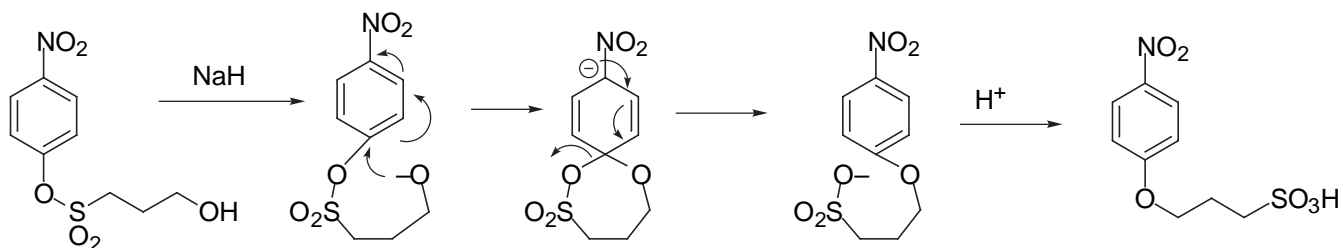
4. Propose a mechanism



1. Provide a mechanism



2. Provide a mechanism



3. Provide multistep syntheses starting from benzene and any materials containing 4 carbons or less

