

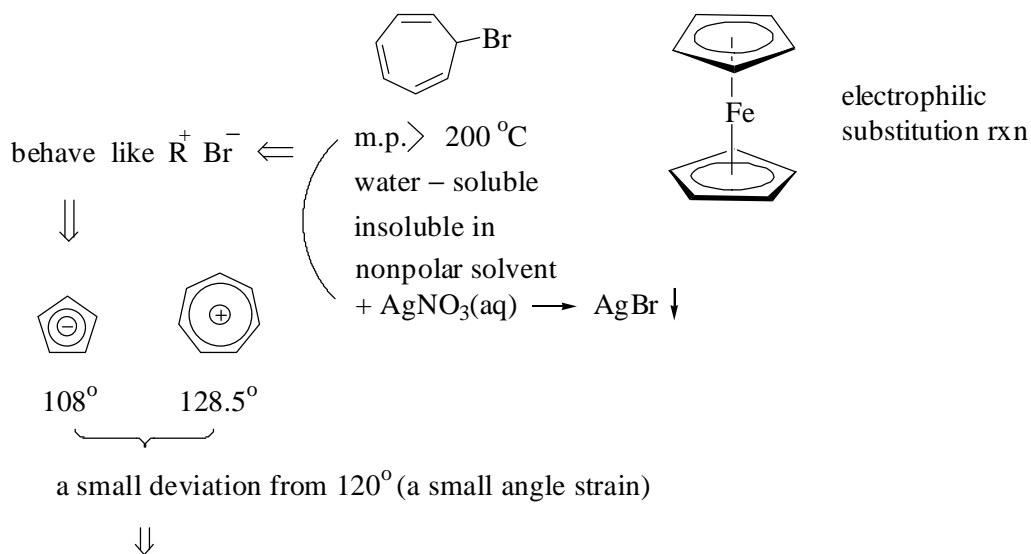
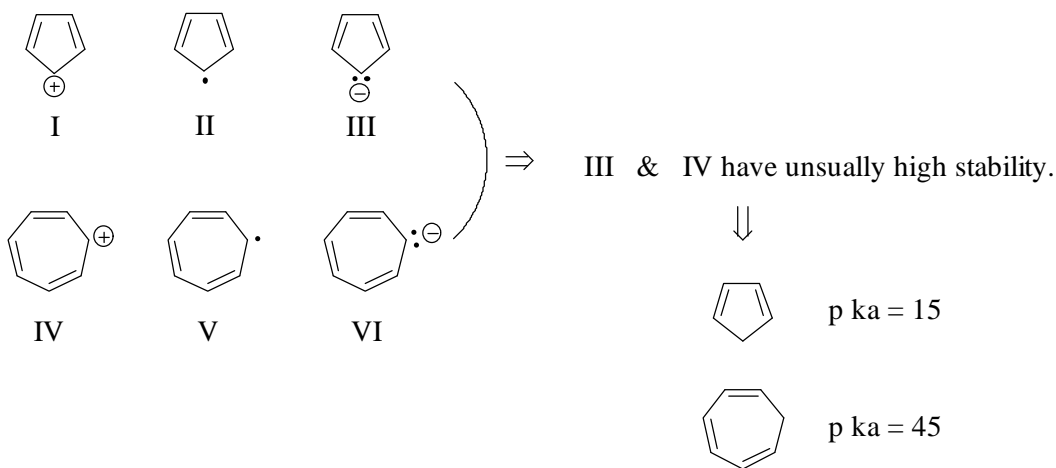
aromatic character ?

◦ experimentally

a high degree of unsaturation
 electrophilic substitution rxn instead of addition rxn.
 low $\Delta H_{\text{hydrogenation}}$ low ΔH_{comb}
 cyclic, flat.

◦ theoretically

cyclic clouds of delocalized p electrons above and below the molecular plane
 (4n + 2) π electrons 4n + 2 rule
 or Hückel rule
 ex) benzene 6 π electrons
 (aromatic sextet)



good overlap of p orbitals



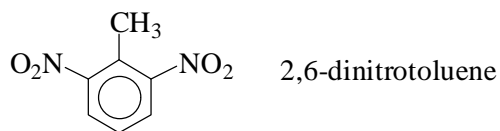
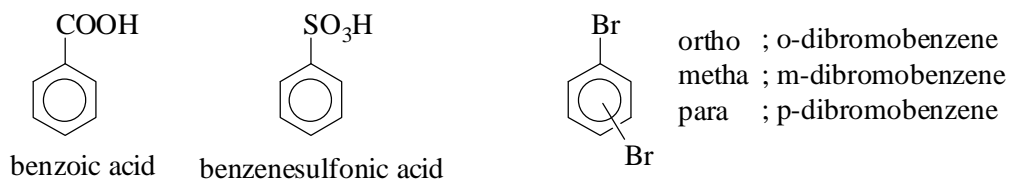
How about 2, 10, 14 ... π electrons ?



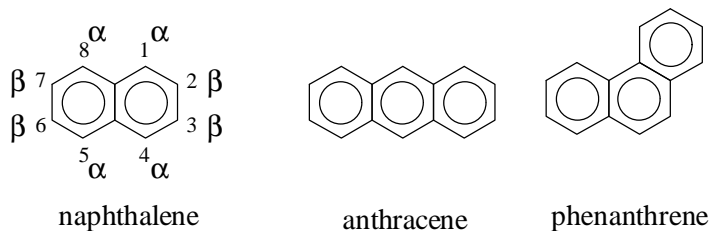
not as stable as benzene due to angle strain or poor overlap of p orbitals but more stable than their relatives.



aromaticity



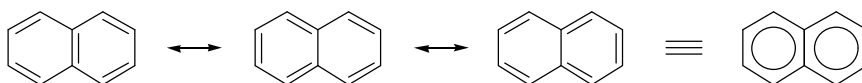
Polynuclear aromatic hydrocarbon



electrophilic substitution rather than addition rxn

ΔH_{comb} : 61 kcal lower, cyclic, flat

6 π electrons \times 2 \rightarrow a pair is shared \rightarrow 10 π electrons



diamond : polycyclic aliphatic

graphite : planar (C–C : 1.42\AA , layers : 3.4\AA , lubricant)

C_{60} (buckminster)fullerene : 20 6-membered rings + 12 5-membered rings

Quantitative elemental analysis

