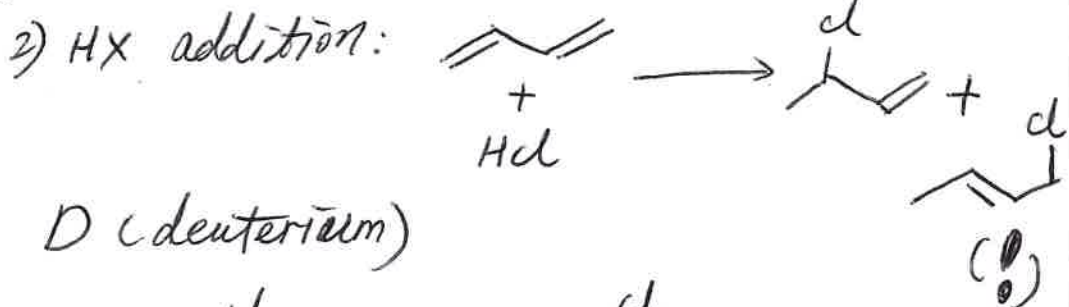


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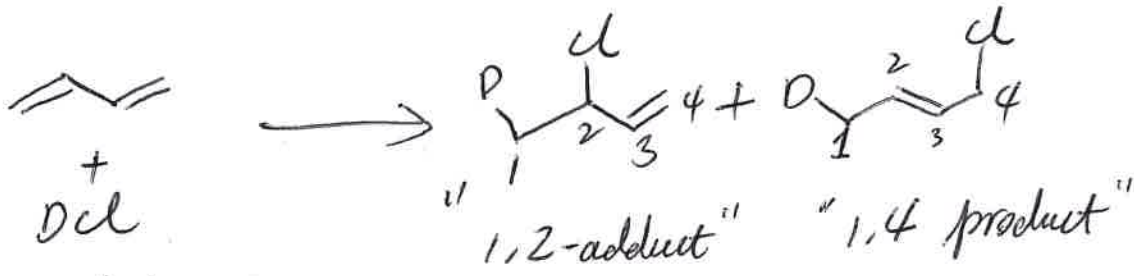
Recall: Distinctive reactivity of conjugated dienes...

1) Diels-Alder Rxn

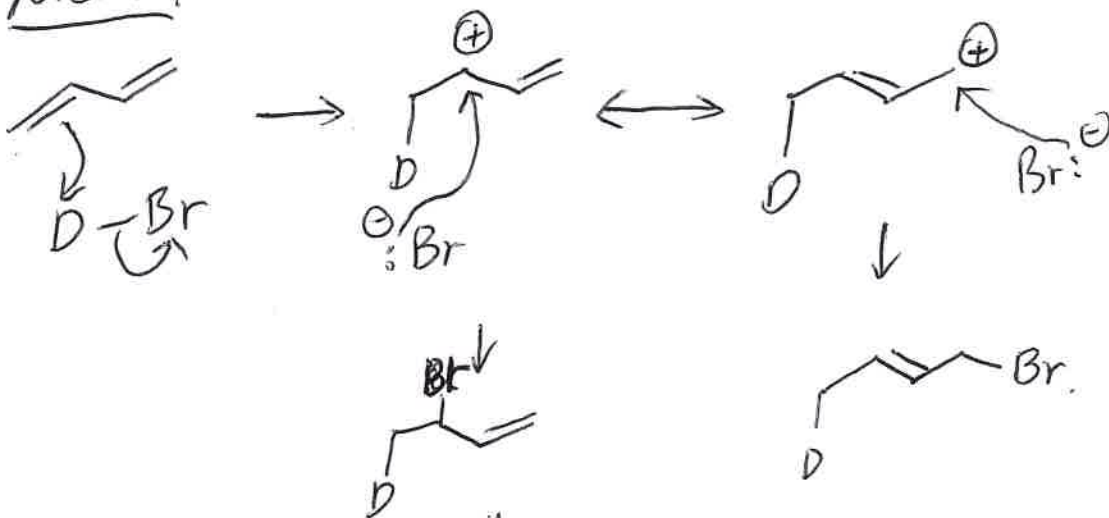


Final, 7:45 AM, Tues. 22 Dec

Label "H" → D (deuterium)



Mech?



replace Br w/ d to be consistent.

Intermediate = an allylic carbocation

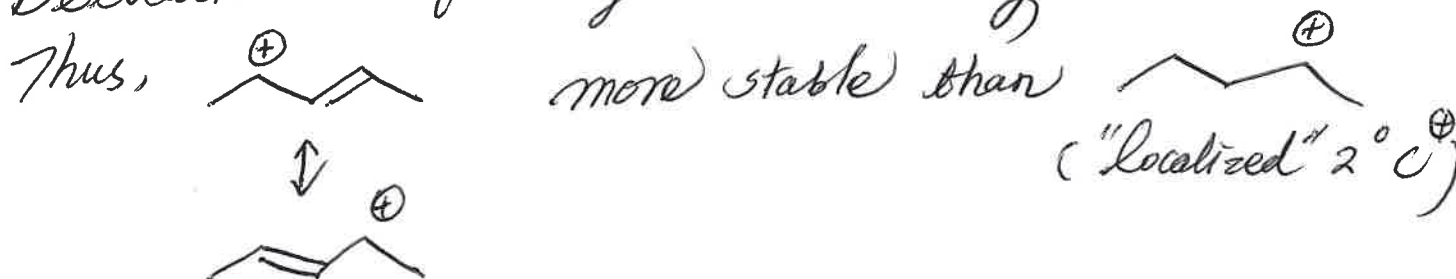


THINK-DO NOT DRAW!

Neither structure "correct", real species is a hybrid.

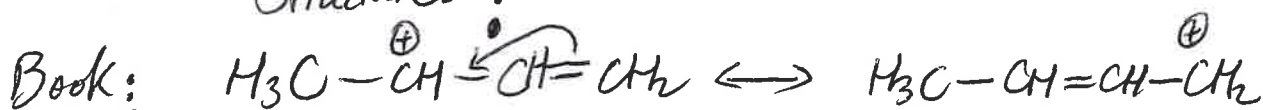
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Delocalization of charge is stabilizing



§ 15.6 - Resonance Structures

CAVEAT: DO NOT use curved arrows to interconvert resonance structures!



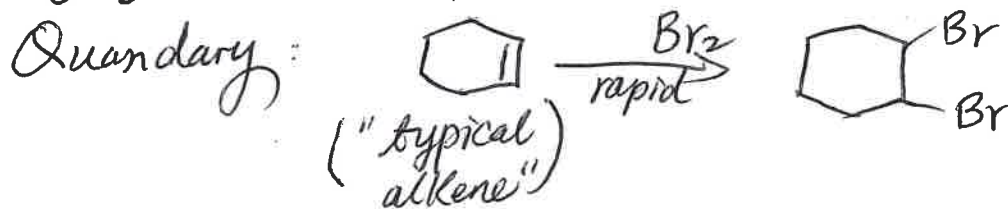
vs.



Aromatic Molecules: Dramatic examples of e⁻ delocalization in π systems.

→ Benzene $\equiv \text{C}_6\text{H}_6$

$\text{C}_6\text{H}_6 \rightarrow \text{DU} = 4 \rightarrow$ some sort of alkene?

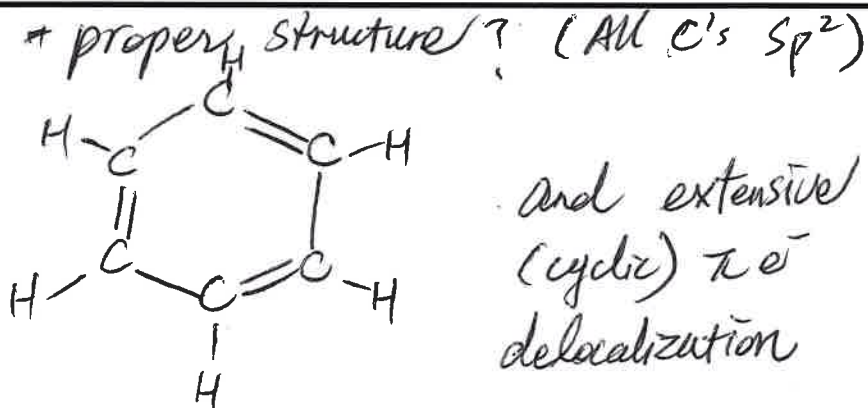


BUT: Benzene $\xrightarrow{\text{Br}_2}$ No rxn

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not Benzene



Correct:



THINK,
 But do not draw!

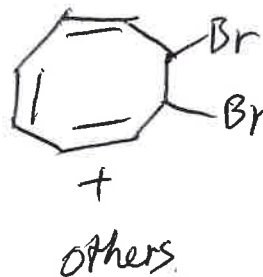
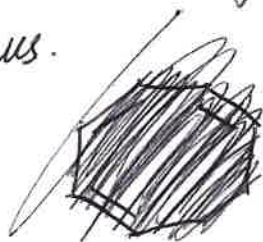
Estimate:

Aromatic delocalization is estimated to contribute $\sim 34 \text{ kcal/mol}$ to benzene stability relative to a hypothetical localized cyclohexatriene.

Defining characteristics for aromatic systems?

Cyclic array of π -bonds is not sufficient.

Thus.




\therefore "Typical" alkene not aromatic

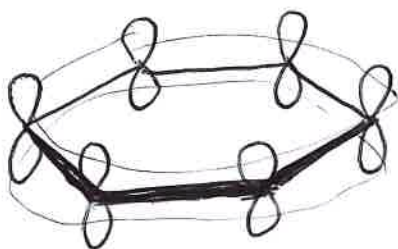
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Structural manifestations:

 is planar.

cyclic deloc. \Rightarrow planar



(COT is not planar)
(p760)

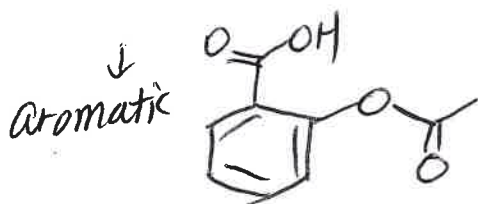
Huckel Rule:

Aromatic π systems ~~are~~ must have $2, 6, 10, \dots, 4n+2$
($n = \text{integer}$)

Requirements for aromaticity

- $4n+2$ πe^- 's
- closed loop of πe^- 's.
- planarity.

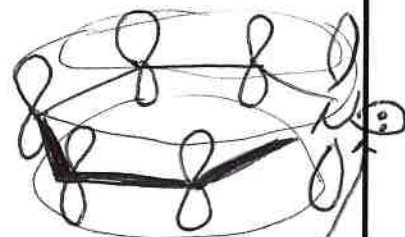
Consider:



pyridine



Aromatic?
(LP?)

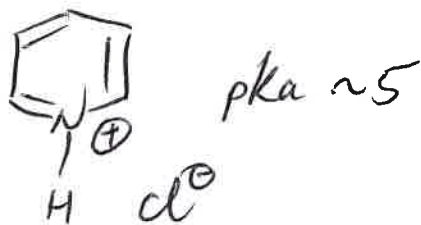


Lone pair
NOT part of
the aromatic π -
system.

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∴ Pyridine is basic.



Contrast: pyrrole.

