

Do Not Use Pencil

Do Not Staple, Please!

Course Chem 345

Lecturer Gellman

Day Wednesday

Date 2-3-16

Notes Taken by Lu Liu

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## Recall: Chap. 16 - Benzene (reactions)



aromatic  $\pi$  system  
cyclic  $\pi$   $e^-$  delocalization.

Think;  
but do not draw! 60-66

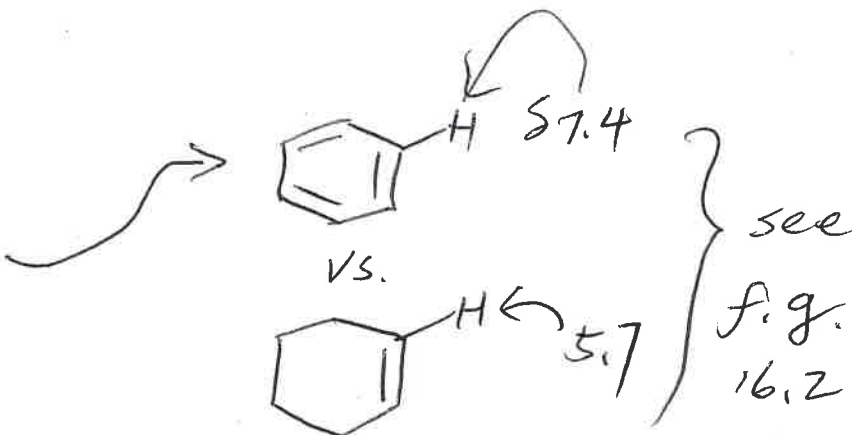
Rec. problems:  
4-9, 12-27, 29-33,  
35-37, 39-41,  
43-46, 48-50, 52-54

## Spectroscopy:

1) IR - real text.

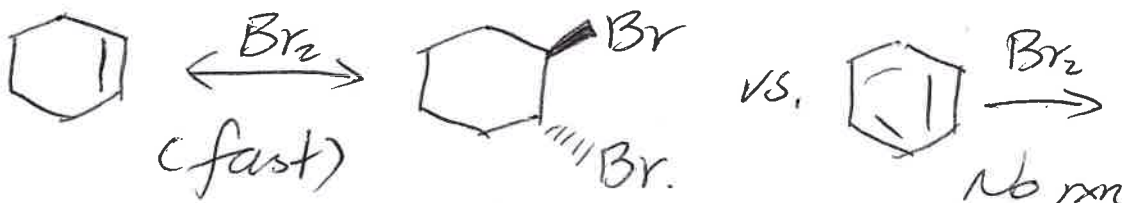
2)  $^1\text{H}$  NMR - " "

3)  $^{13}\text{C}$  NMR - " "



## Electrophilic aromatic substitution (EAS)

### Recall:



Need a stronger electrophile to entice the aromatic  $\pi$ -system to react.  $\rightarrow$  Include a Lewis acid!

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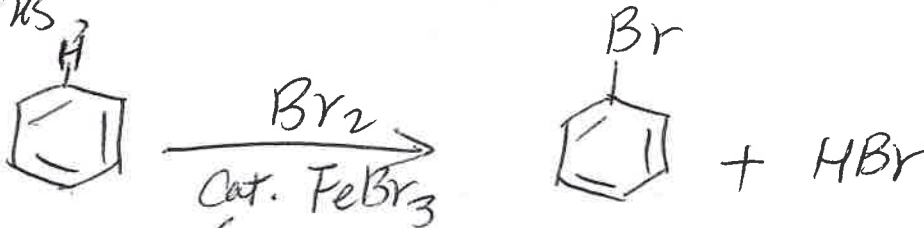
Date 2-3-16

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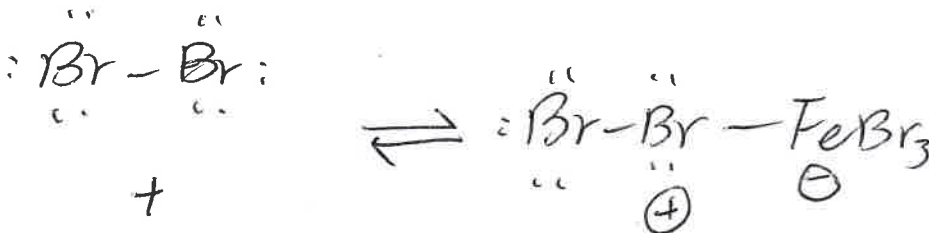
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7 hrs



"Catalyst"

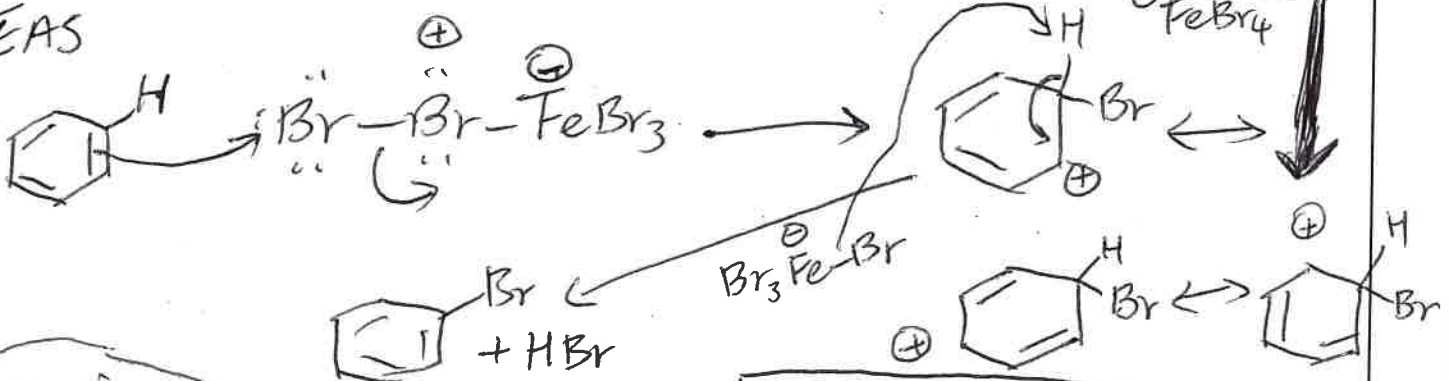
Generation of a strong electrophile -



FeBr<sub>3</sub>

the 3 cationic intermediates

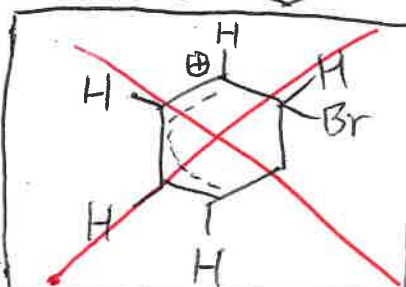
EAS



Cationic intermediate

(+ FeBr<sub>3</sub>)

H highly delocalized  
⊕ charge, but NOT aromatic



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Do not use curved arrows to interconvert res. structures.

Many versions of EAS rxns!  
Simple variation - Chlorination



You fill in mechanism in notes!

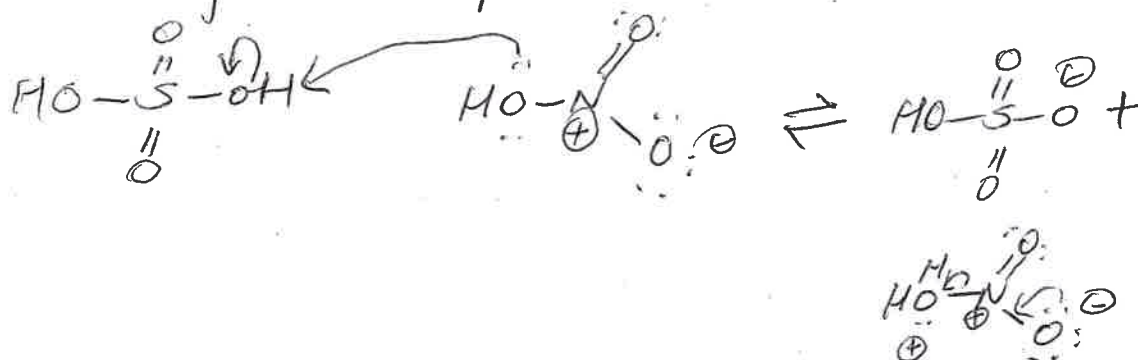
Nitration (adding a Nitro group)



Note:



Generation of electrophile



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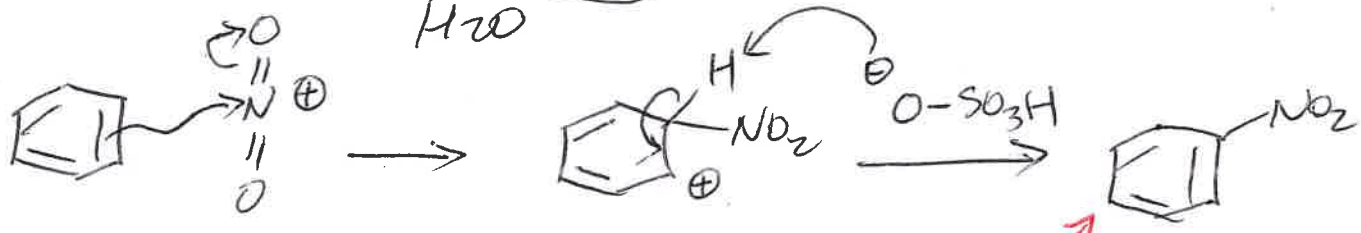
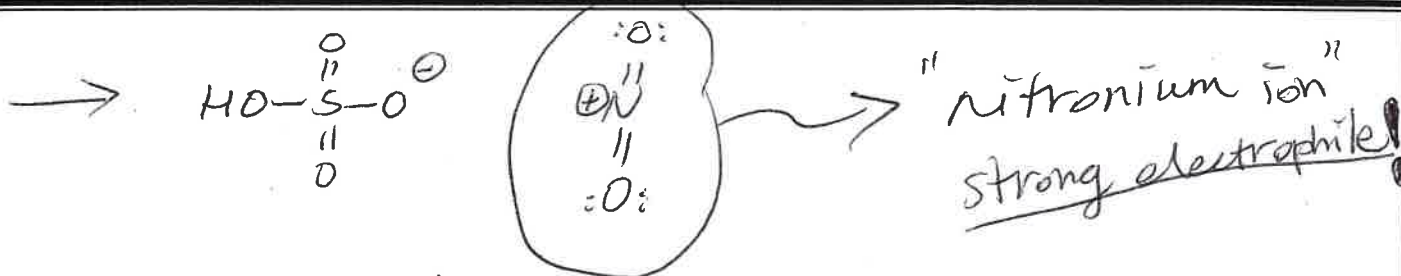
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See text's mech.

p803 - poor

Not all res. structures of intermediate are shown.

