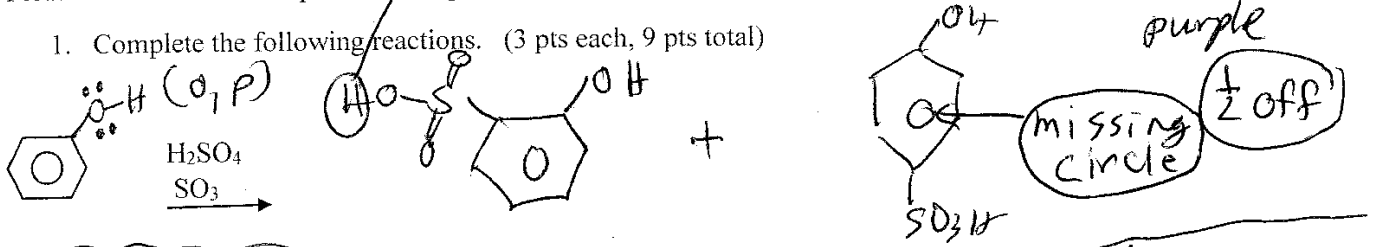
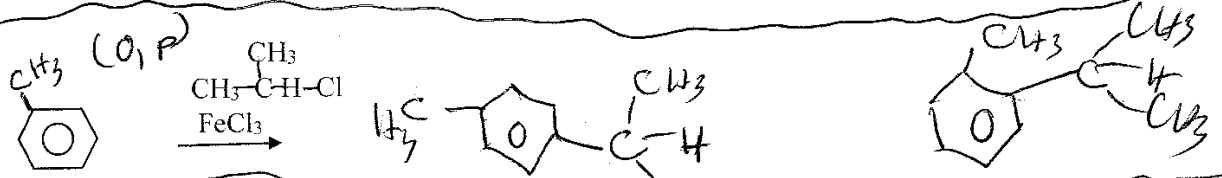
Organic Chem II (CHEM 442) Spring 2016 Dr. Hahn 3/2 W Form A MWF-1 pm Quiz III Exam # _____

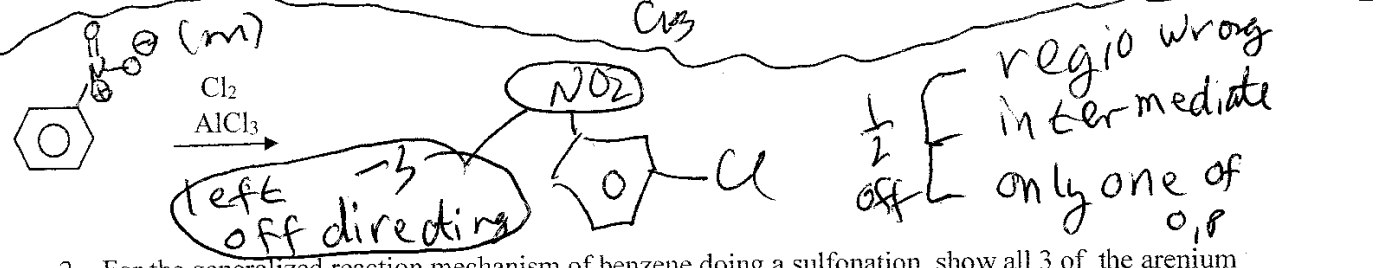
Sign Name Key (left off H -½ pt) Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (25 pts) color

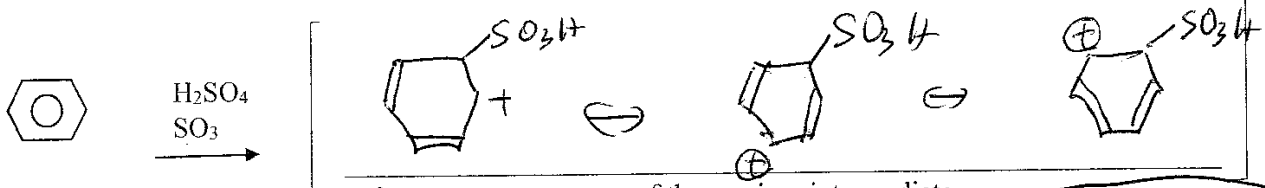
1. Complete the following reactions. (3 pts each, 9 pts total)







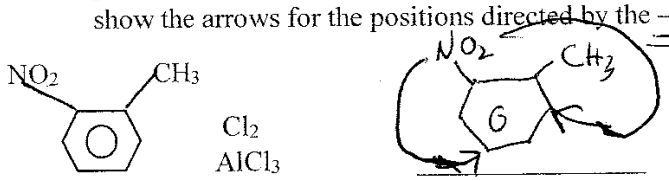
2. For the generalized reaction mechanism of benzene doing a sulfonation, show all 3 of the arenium intermediate resonance structures with the $-SO_3H$ attached to the benzene ring. (3 pts each, 9 pts)



3 resonance structures of the arenium intermediate

bad resonance -1/2, left off charge -½ pt

3. For the following, reaction on the benzene with the substituent shown, draw arrows directing to the positioning of the incoming Cl. Show the arrows for the positions directed by the $-NO_2$ group and show the arrows for the positions directed by the $-CH_3$ group (3.5 pts each, 7 pts total)

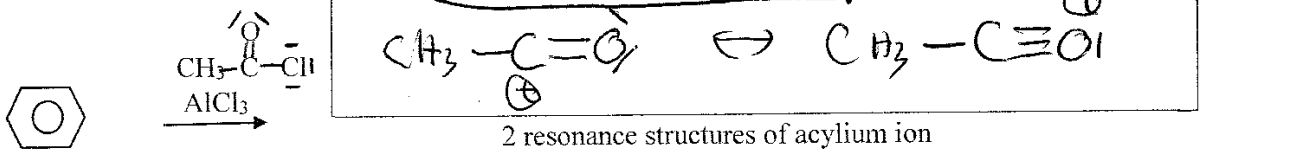


directed by NO_2 group

directed by CH_3 group

wrong regio -½

Extra Credit: (2 pts) Show the 2 resonance structures of the acylium ion for the following reaction.



somewhat wrong -½ pt

lonepair or charge

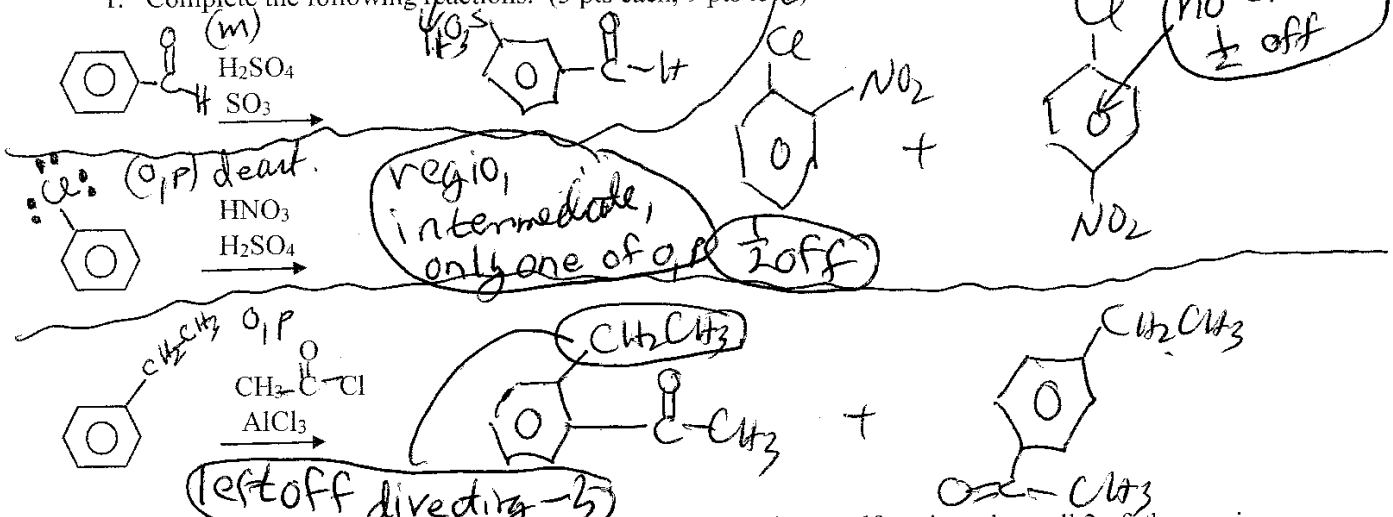
2 resonance structures of acylium ion

Organic Chem II (CHEM 442) Spring 2016 Dr. Hahn 3/2 W Form B MWF-1 pm Quiz III Exam # _____

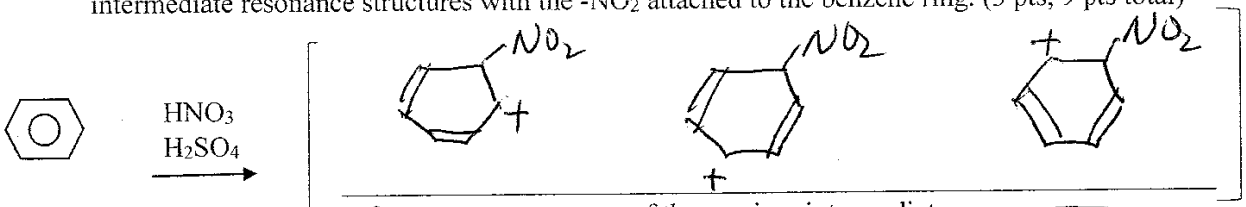
Sign Name _____ Print Name _____

Please show work on all questions for partial ~~credit even on~~ questions which do not specify. (25 pts)

1. Complete the following reactions. (3 pts each, 9 pts total)

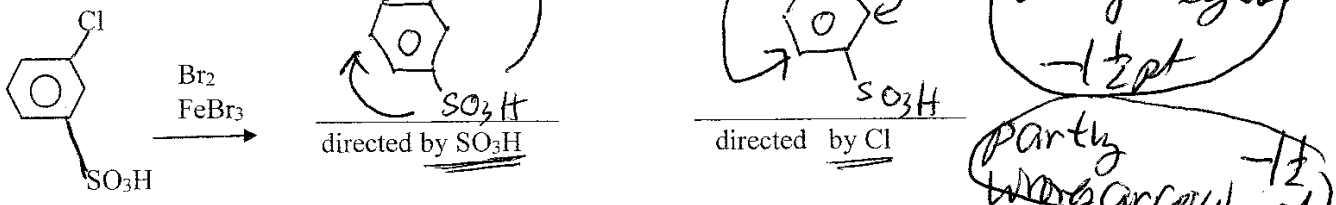


2. For the ~~generalized reaction mechanism~~ of benzene doing a sulfonation, show all 3 of the arenium intermediate resonance structures with the $-NO_2$ attached to the benzene ring. (3 pts, 9 pts total)



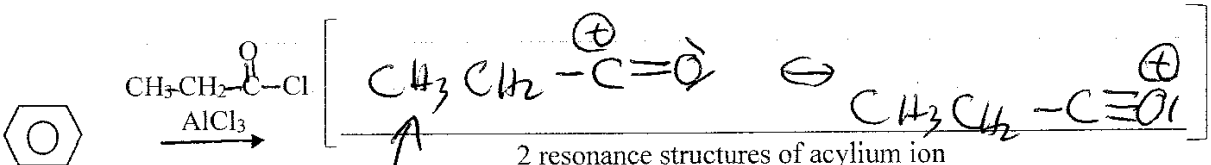
3 resonance structures of the arenium intermediate

3. For the following, reaction on the benzene with the substituent shown, ~~draw arrows directing~~ to the positioning of the incoming Br. Show the arrows for the positions directed by the - SO_3H group and show the arrows for the positions directed by the –Cl group (3.5 pts each, 7 pts total)



directed by SO_3H directed by Cl

Extra Credit: (2 pts) Show the 2 resonance structures of the acylium ion for the following reaction.



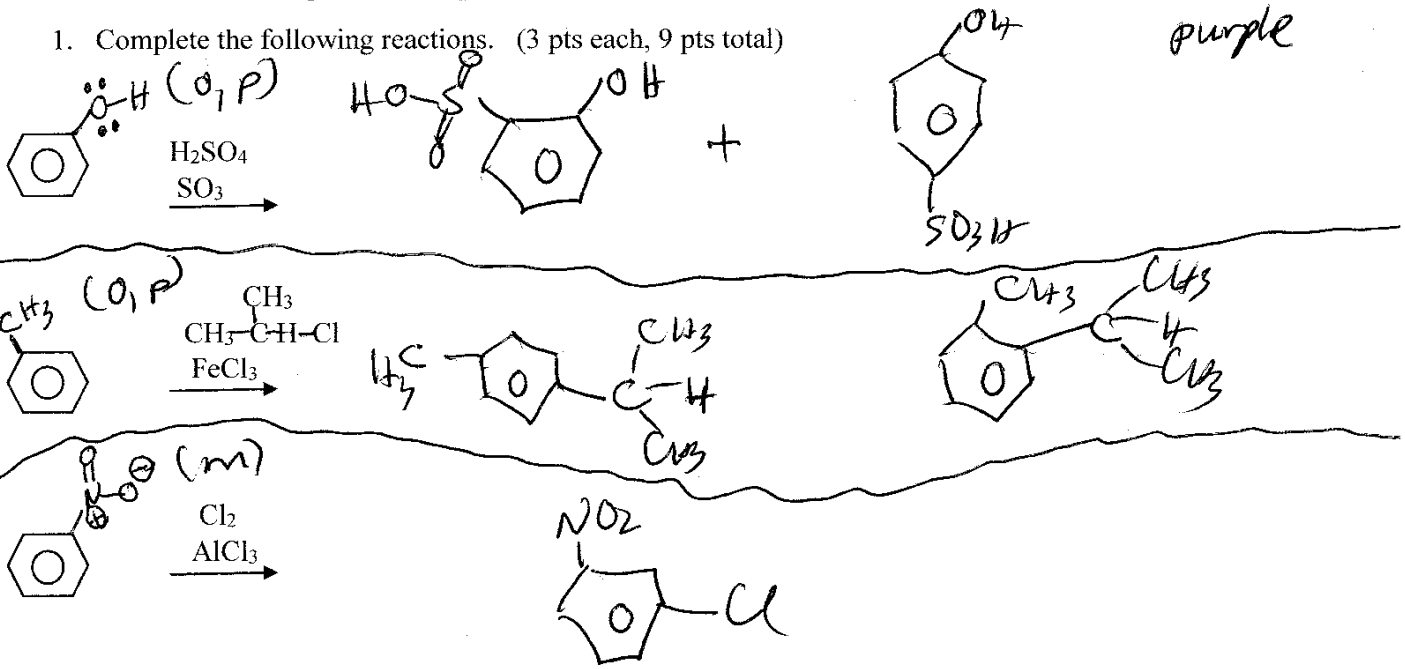
2 resonance structures of acylium ion

Organic Chem II (CHEM 442) Spring 2016 Dr. Hahn 3/2 W Form A MWF-1 pm Quiz III Exam # _____

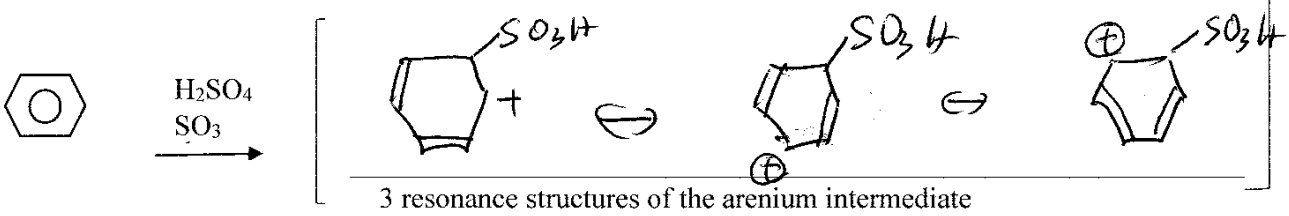
Sign Name Key Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (25 pts) color purple

1. Complete the following reactions. (3 pts each, 9 pts total)

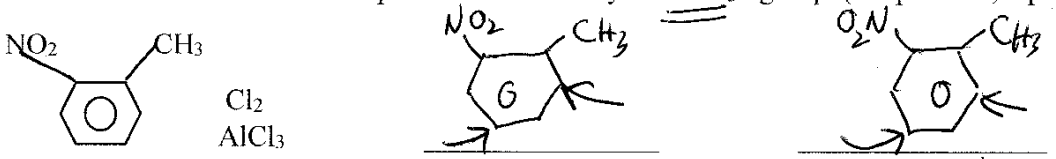


2. For the generalized reaction mechanism of benzene doing a sulfonation, show all 3 of the arenium intermediate resonance structures with the -SO_3H attached to the benzene ring. (3 pts each, 9 pts)



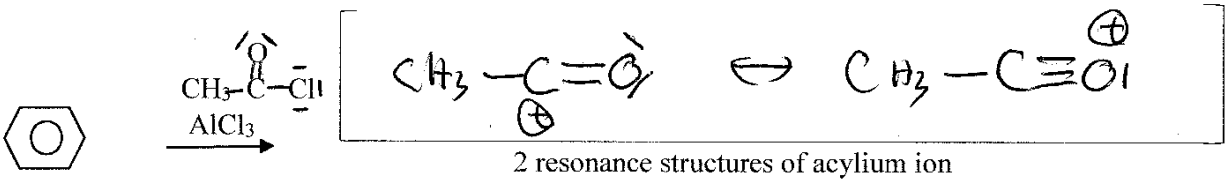
3 resonance structures of the arenium intermediate

3. For the following, reaction on the benzene with the substituent shown, draw arrows directing to the positioning of the incoming Cl. Show the arrows for the positions directed by the -NO_2 group and show the arrows for the positions directed by the –CH_3 group (3.5 pts each, 7 pts total)



directed by NO_2 directed by CH_3 group

Extra Credit: (2 pts) Show the 2 resonance structures of the acylium ion for the following reaction.



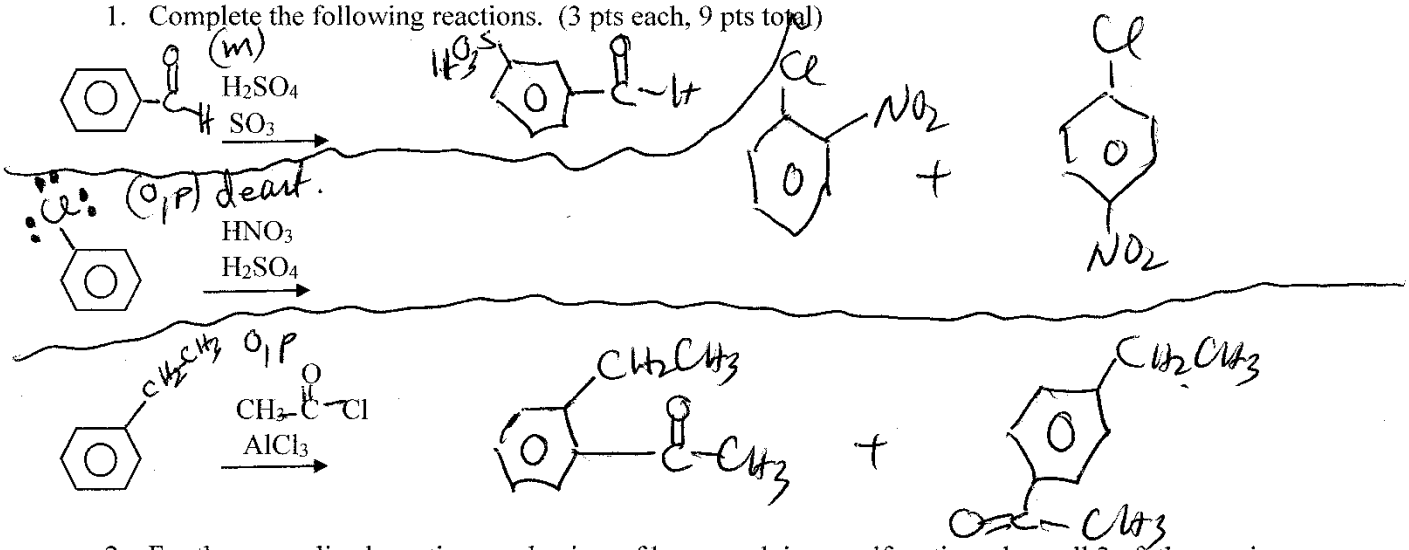
2 resonance structures of acylium ion

Organic Chem II (CHEM 442) Spring 2016 Dr. Hahn 3/2 W Form B MWF-1 pm Quiz III Exam # _____

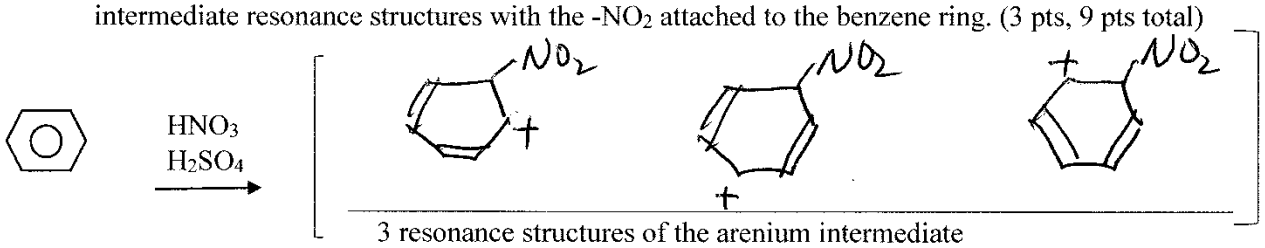
Sign Name _____ Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (25 pts)

1. Complete the following reactions. (3 pts each, 9 pts total)

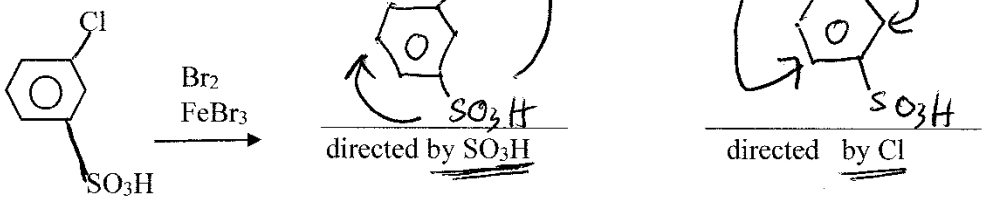


2. For the generalized reaction mechanism of benzene doing a sulfonation, show all 3 of the arenium intermediate resonance structures with the -NO_2 attached to the benzene ring. (3 pts, 9 pts total)



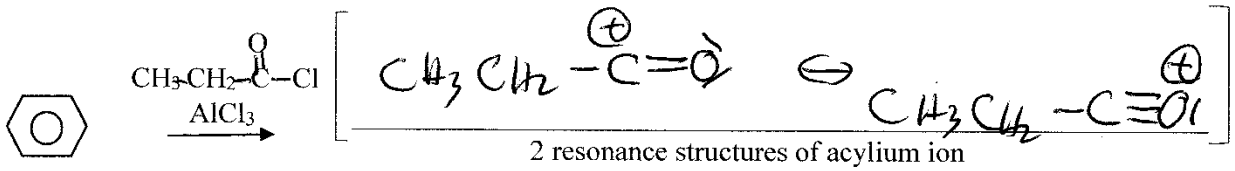
3 resonance structures of the arenium intermediate

3. For the following, reaction on the benzene with the substituent shown, draw arrows directing to the positioning of the incoming Br. Show the arrows for the positions directed by the - SO_3H group and show the arrows for the positions directed by the –Cl group (3.5 pts each, 7 pts total)



directed by SO_3H directed by Cl

Extra Credit: (2 pts) Show the 2 resonance structures of the acylium ion for the following reaction.



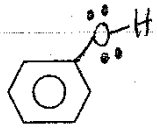
2 resonance structures of acylium ion

Organic Chem II (CHEM 442) Spring 2016 Dr. Hahn 3/2 W Form A MWF-1 pm Quiz III Exam # D-11

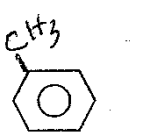
Sign Name _____ Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (25 pts) color

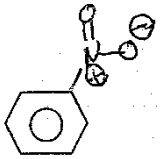
1. Complete the following reactions. (3 pts each, 9 pts total)



H_2SO_4
SO_3



CH_3
$CH_3-\overset{}{C}H-Cl$
$FeCl_3$



Cl_2
$AlCl_3$

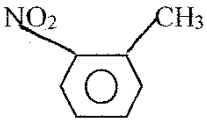
2. For the generalized reaction mechanism of benzene doing a sulfonation, show all 3 of the arenium intermediate resonance structures with the $-SO_3H$ attached to the benzene ring. (3 pts each, 9 pts)

H_2SO_4
SO_3

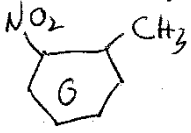
[_____]

3 resonance structures of the arenium intermediate

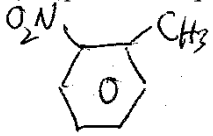
3. For the following, reaction on the benzene with the substituent shown, draw arrows directing to the positioning of the incoming Cl. Show the arrows for the positions directed by the $-NO_2$ group and show the arrows for the positions directed by the $-CH_3$ group (3.5 pts each, 7 pts total)



Cl_2
$AlCl_3$



directed by NO_2



directed by CH_3 group

Extra Credit: (2 pts) Show the 2 resonance structures of the acylium ion for the following reaction.

$CH_3-\overset{O}{\overset{\|}{C}}-Cl$
$AlCl_3$

[_____]

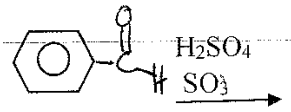
2 resonance structures of acylium ion

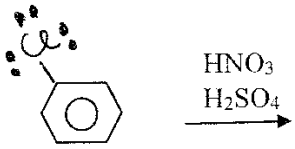
Organic Chem II (CHEM 442) Spring 2016 Dr. Hahn 3/2 W Form B MWF-1 pm Quiz III Exam # X-5

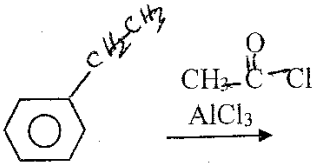
Sign Name _____ Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (25 pts)

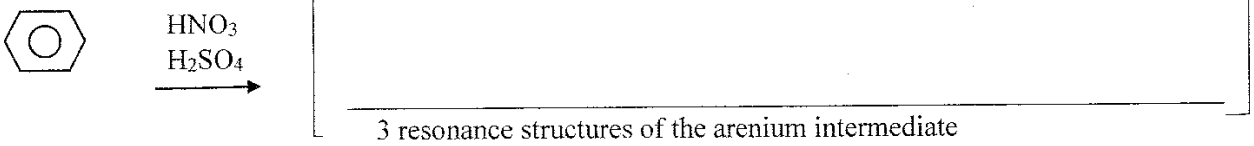
1. Complete the following reactions. (3 pts each, 9 pts total)





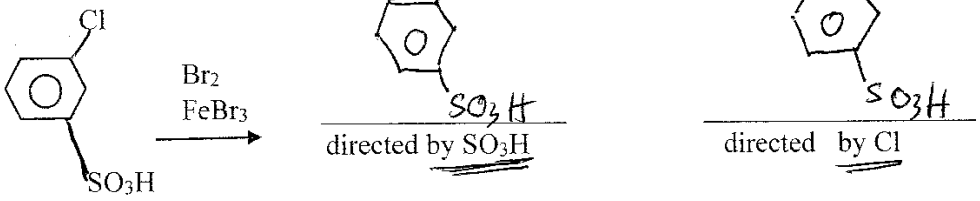


2. For the generalized reaction mechanism of benzene doing a sulfonation, show all 3 of the arenium intermediate resonance structures with the -NO_2 attached to the benzene ring. (3 pts, 9 pts total)



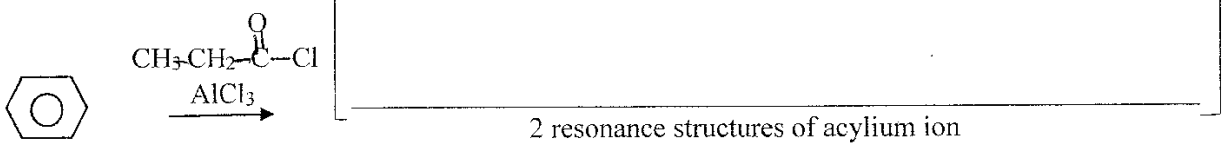
3 resonance structures of the arenium intermediate

3. For the following, reaction on the benzene with the substituent shown, draw arrows directing to the positioning of the incoming Br. Show the arrows for the positions directed by the - SO_3H group and show the arrows for the positions directed by the –Cl group (3.5 pts each, 7 pts total)



directed by SO_3H directed by Cl

Extra Credit: (2 pts) Show the 2 resonance structures of the acylium ion for the following reaction.



2 resonance structures of acylium ion