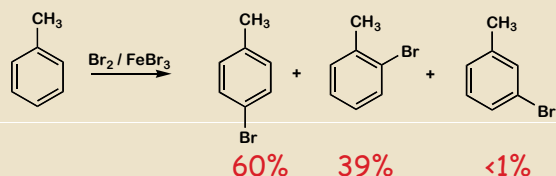
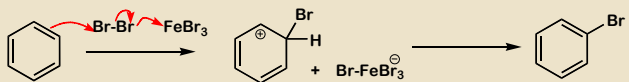
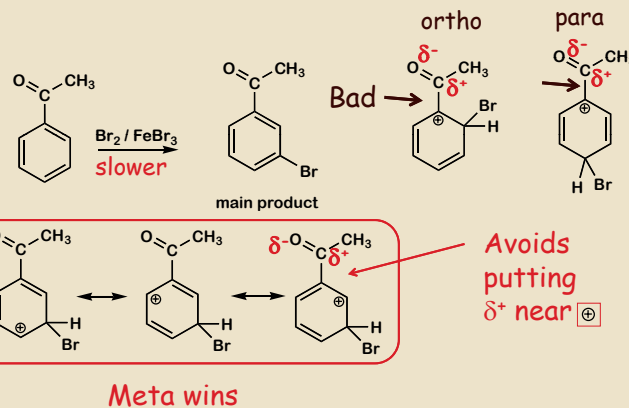
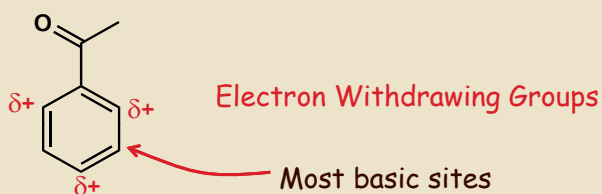
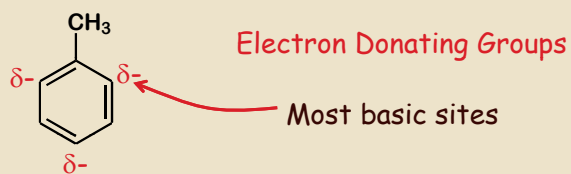
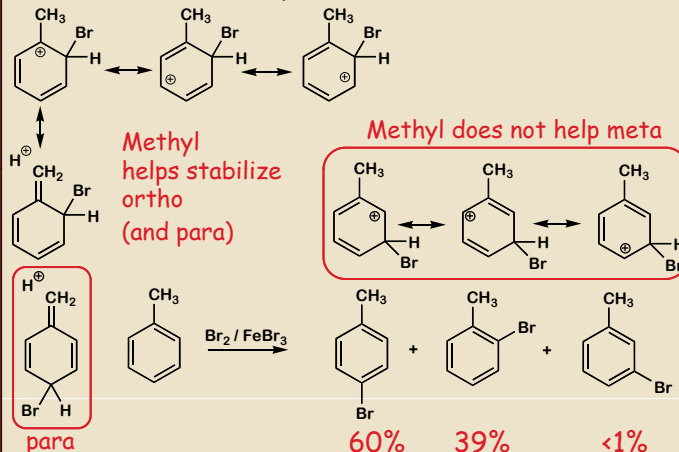


Review from Monday

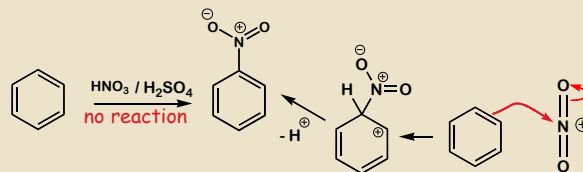
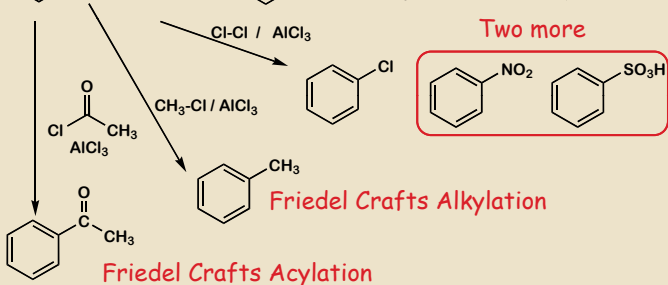
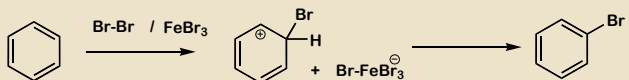
Electrophilic Aromatic Substitution Reactions



Review from Monday



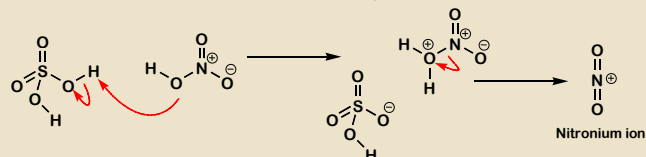
Electrophilic Aromatic Substitution Reactions

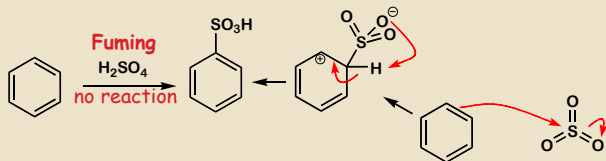


Electrophilic Aromatic Substitution

How can you make HNO₃ a stronger acid?

Add another acid.

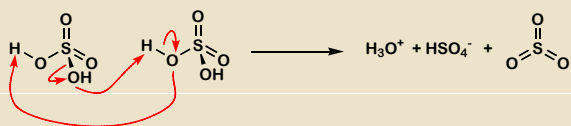




Electrophilic Aromatic Substitution

How can you make H_2SO_4 a stronger acid?

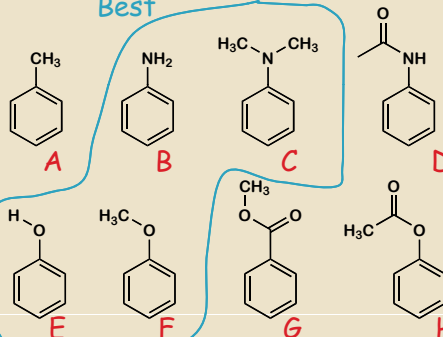
Add another acid.



Now that we have all our reactions, let's summarize activation and deactivation

Electron Donating Groups activate the ring

Best



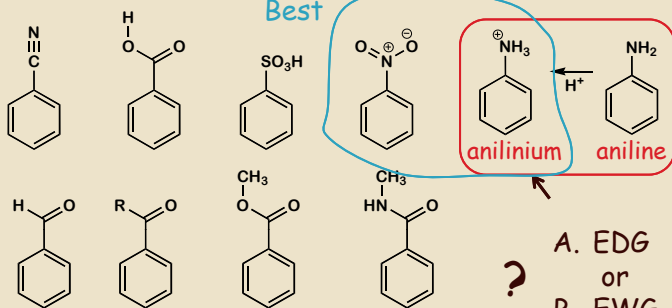
Which one is not a EDG?

Direct substitution ortho/para

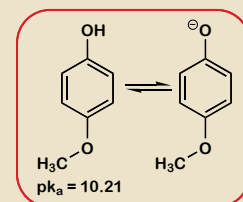
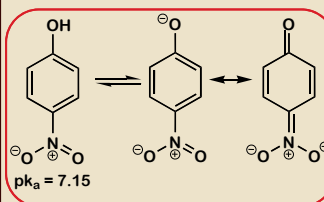
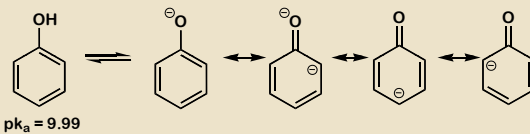
Now that we have all our reactions, let's summarize activation and deactivation

Electron Withdrawing Groups deactivate the ring

Best



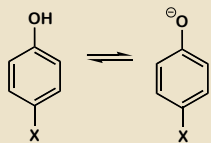
Direct substitution meta



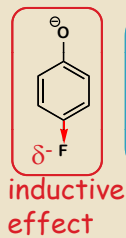
Predict pK_a

A. less than 10

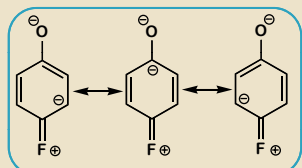
B. greater than 10



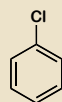
-X	pK_a
-H	9.99
$-\text{NO}_2$	7.15
$-\text{OCH}_3$	10.21
$-\text{CH}_3$	10.26
$-\text{CN}$	8.61
$-\text{COCH}_3$	8.05
$-\text{CF}_3$	8.68
-F	9.89
-Cl	9.41



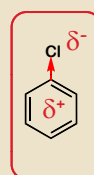
inductive effect



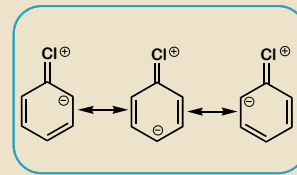
resonance effect



What about a halide? Does a Cl activate or deactivate the ring?



inductive effect



resonance effect

Cl poor at π bonding

Deactivates, but directs ortho-para