Test 3 Postponed until May 3

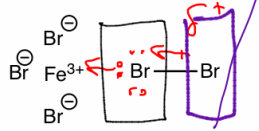
Hand in reworked Test 2 Today

Please get me any review sheets that you haven't handed in so I can give you the points for the review

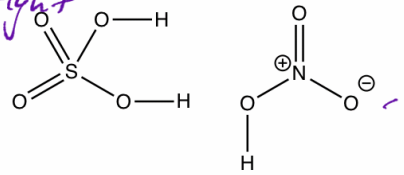
E+

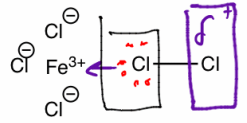
Br + Cl close to iron lose e⁻ density to the iron. So they draw e⁻ density from the Br + Cl

Lewis Acid

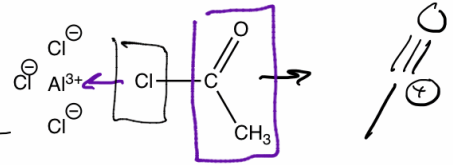


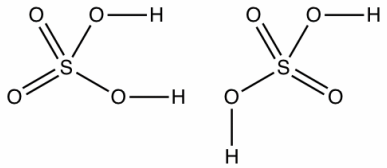
≡ "Br+" on the right

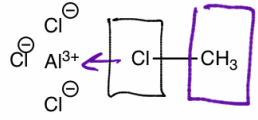




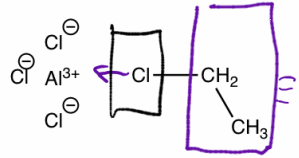
≡ "Cl+"



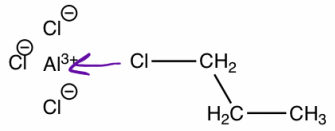




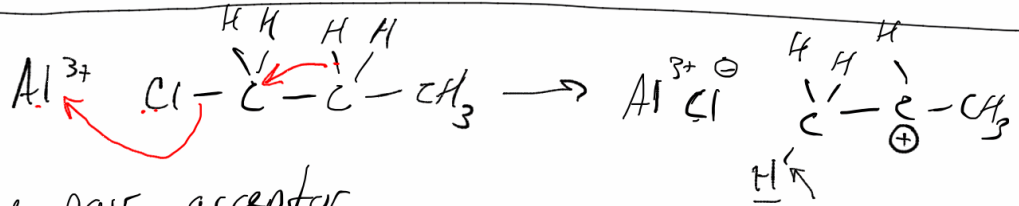
≡ "CH_3^+"



≡ "$CH_3CH_2^+$"



≡



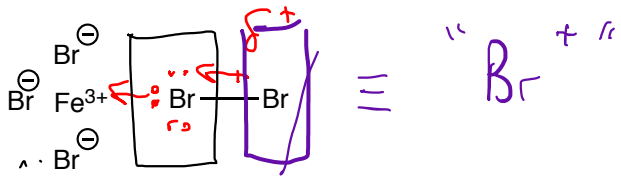
Lewis acid is a lone pair acceptor

Review EAS

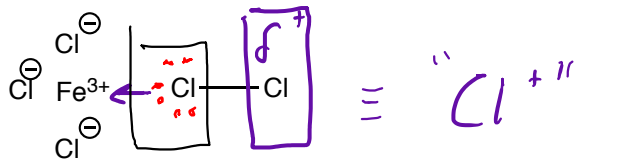
Sections 18.2 – 8

Lewis Acid E^+

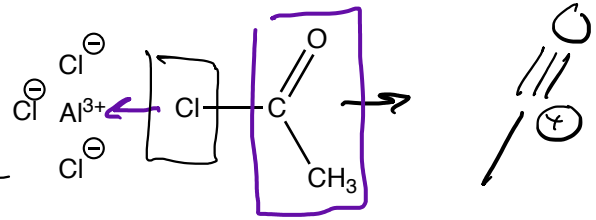
Use an acid to get the leaving group to leave

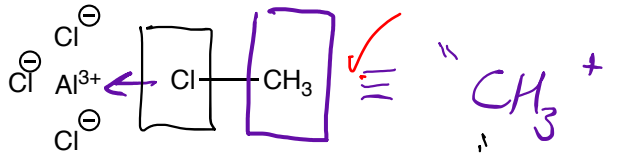


$\equiv$ "Br^+"

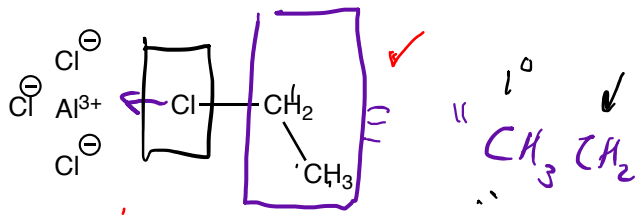


$\equiv$ "Cl^+"

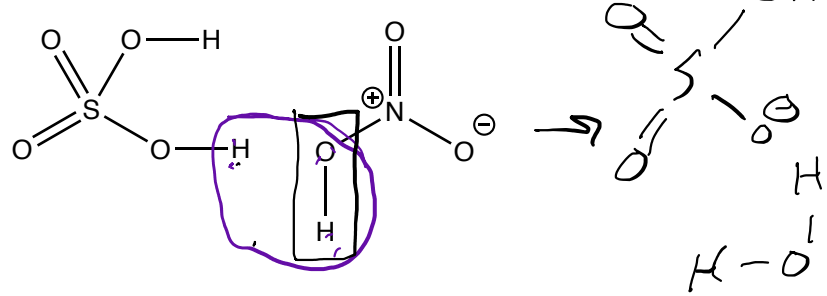


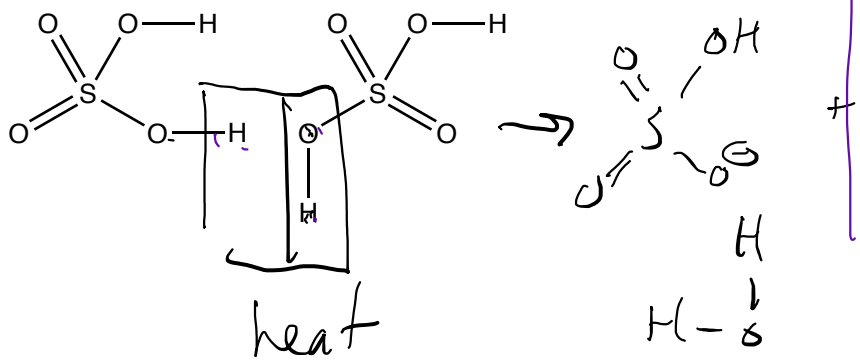


$\equiv$ "CH_3^+"



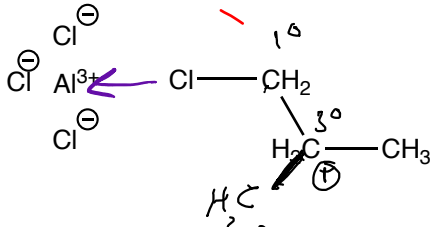
$\equiv$ "$CH_3CH_2^+$"

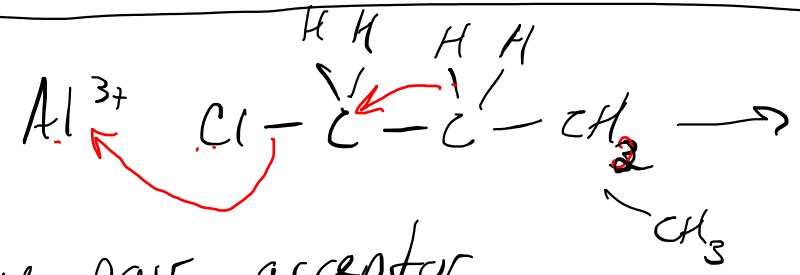




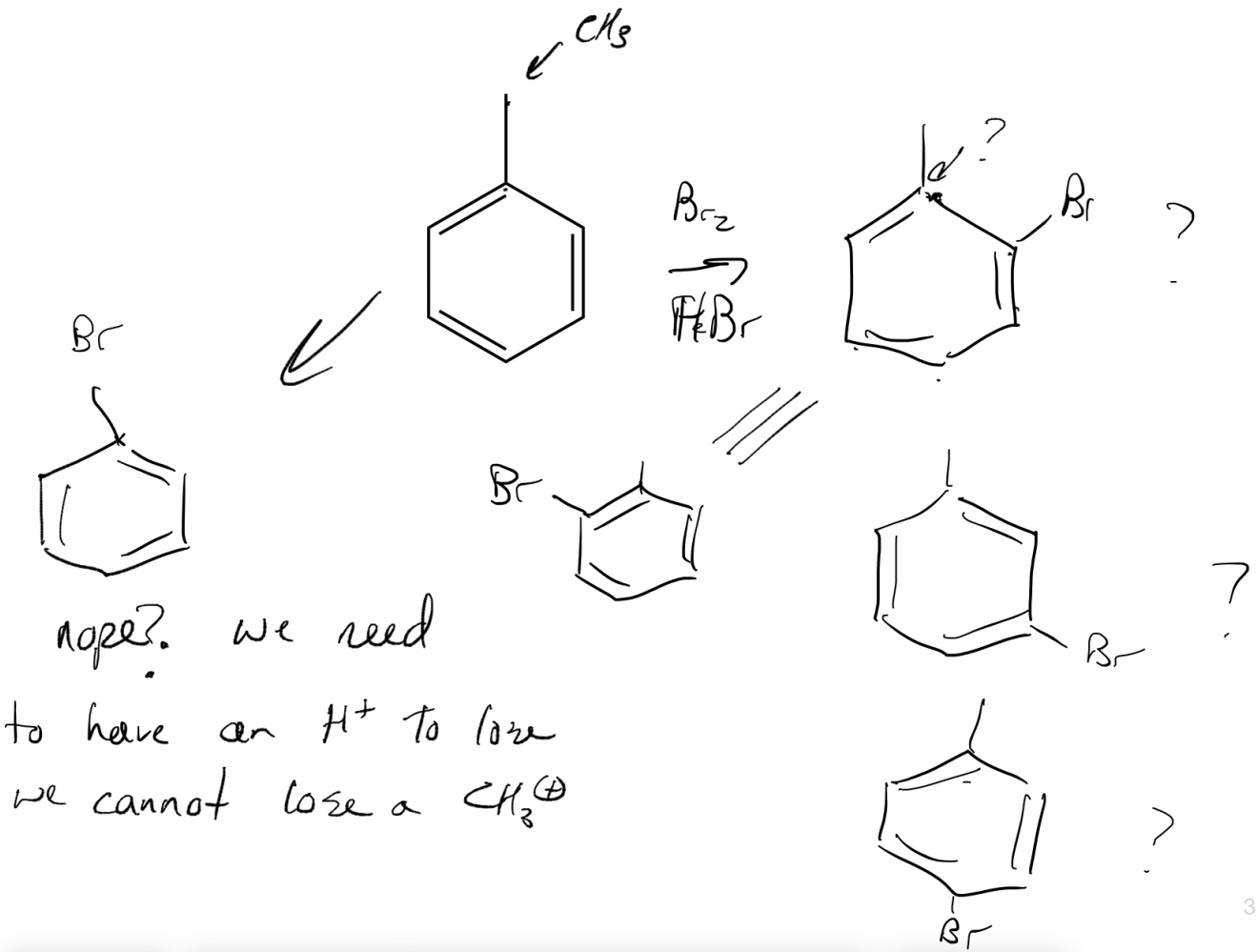
heat

Find the electrophile, take an H^+ off put the E^+ on.

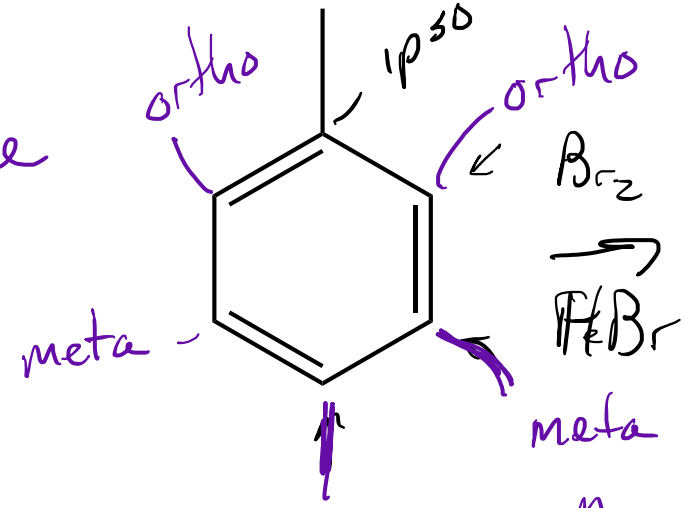




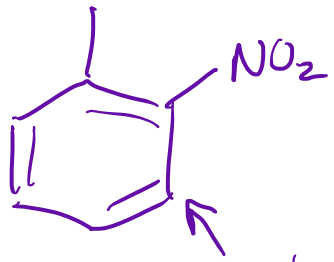
Lewis acid is a lone pair acceptor


CH3
Br2
FeBr3
Br
?
Br
?
Br
Br
?
nope? we need
to have an H+ to lose
we cannot lose a CH3+
Br
?

toluene



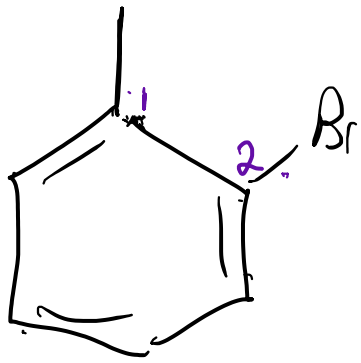
o-bromotoluene



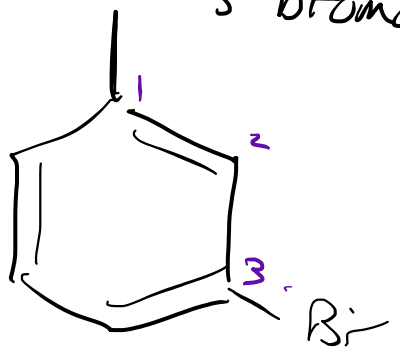
ortho to nitro group

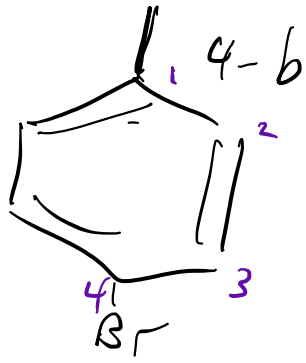
meta to the methyl group

2-bromotoluene



3-bromotoluene





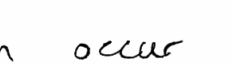
Can occur via two mechanisms ....

Electronegative elements draw e⁻'s toward themselves through σ bonds

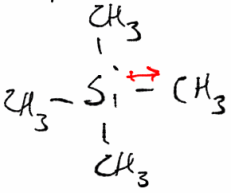
σ withdrawing

σ donating

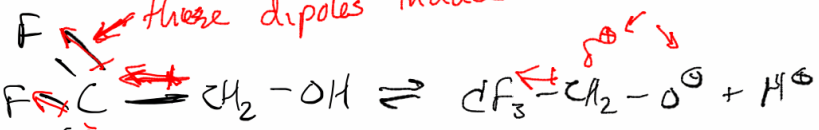
} inductive effect



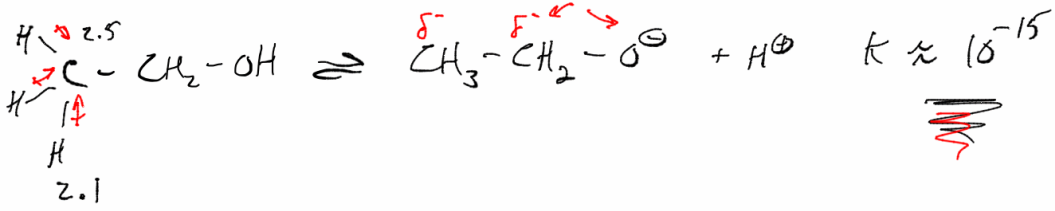
Electropositive elements



these dipoles induce a second dipole – inductive effect



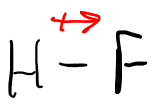
$K \approx 10^{-4}$



$K \approx 10^{-15}$

Can occur via two mechanisms ....

Electronegative elements draw e⁻'s toward themselves through σ bonds

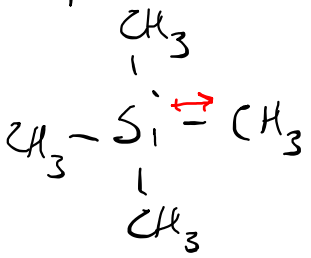


σ withdrawing

σ donating

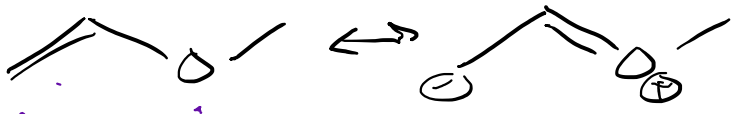
} inductive effect

Electropositive elements



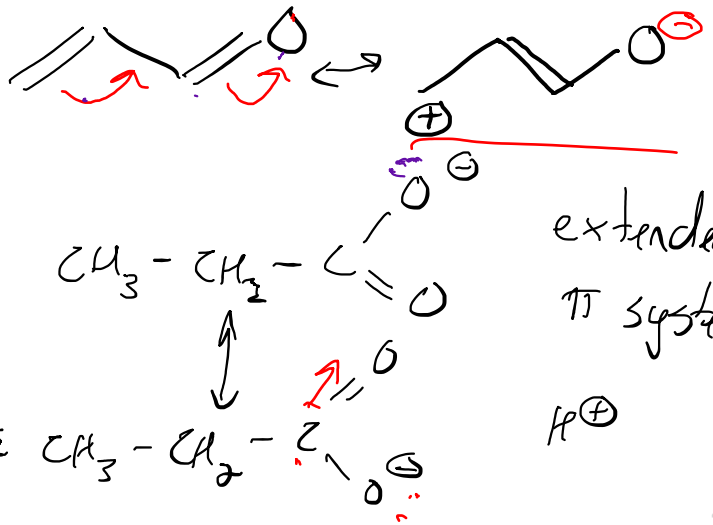
Extended π systems (resonance)

π donating



C atom is more e⁻ rich

π withdrawing



extended π system

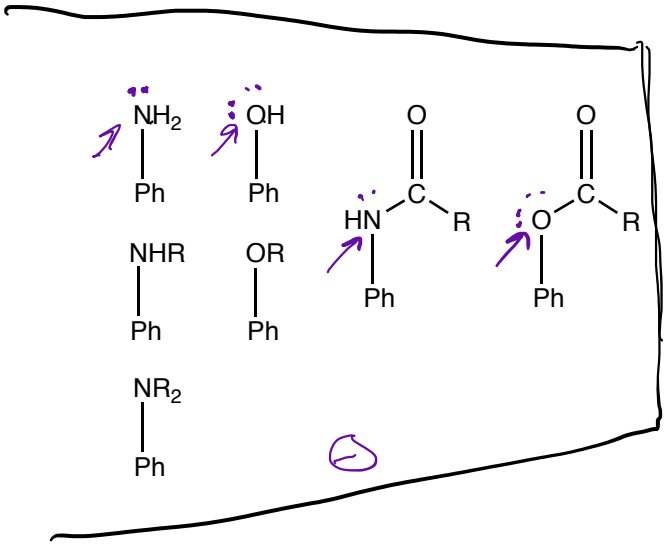
CH_3-CH_2-OH vs $CH_3-CH_2-C(=O)-OH \rightleftharpoons CH_3-CH_2-C(-O^{\ominus})=O$ $H^{\oplus}$

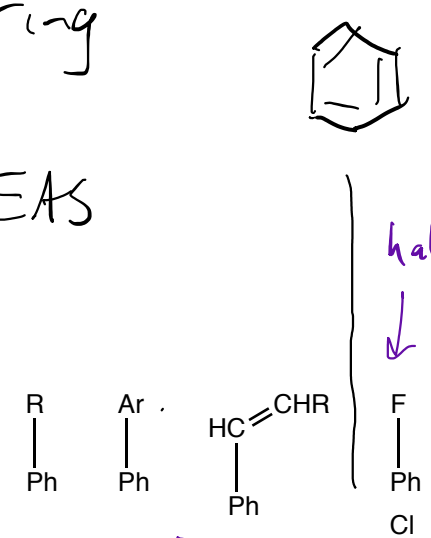
substituents activate the benzene ring toward EAS

faster easier EAS

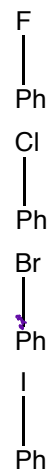
deactivate

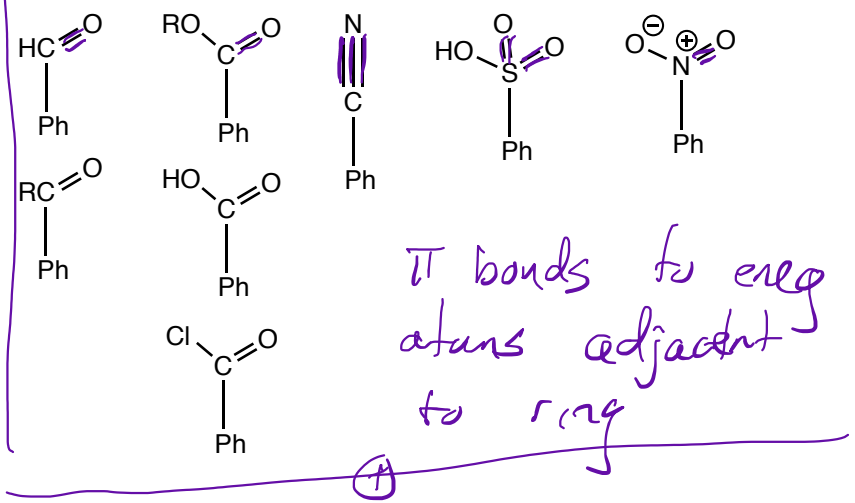
slower harder EAS





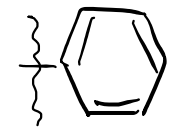
halogens



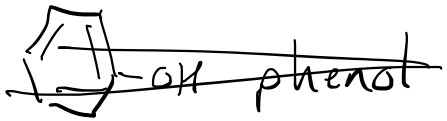


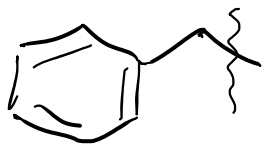
π bonds to ring atoms adjacent to ring

Ph = phenyl



Ar = aromatic





benzyl = Bn = Bz