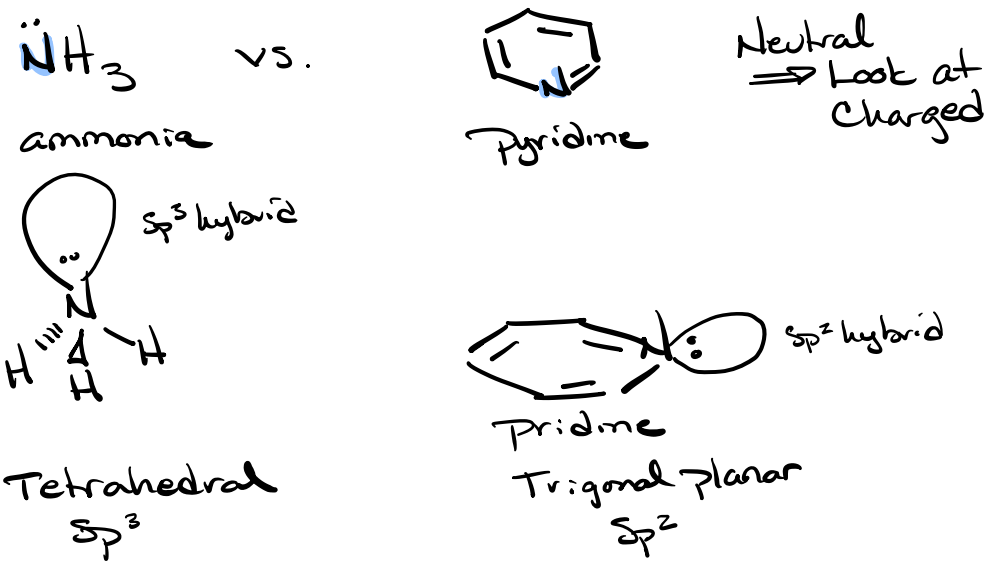
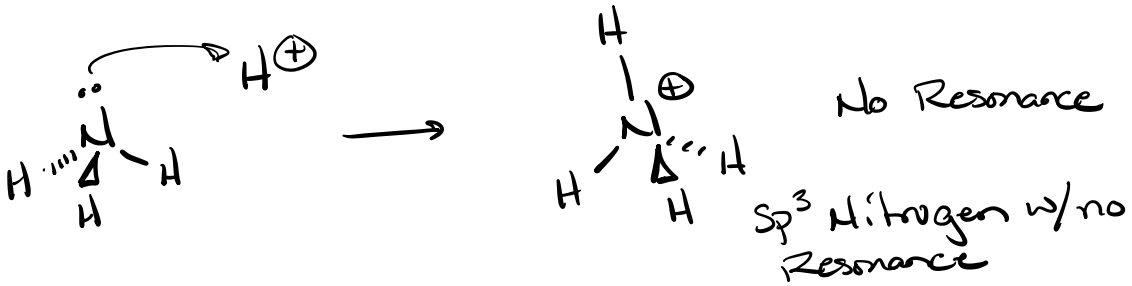
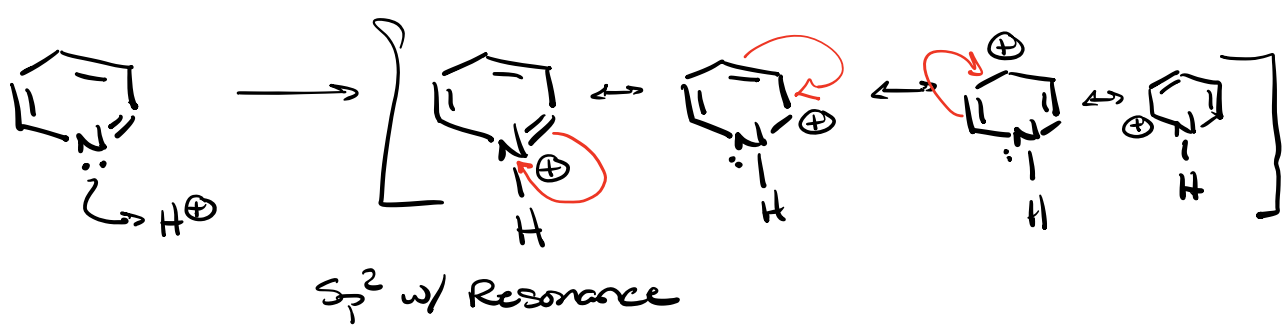
Acid - Base Continued

Base

Which of these amine bases is the most basic?



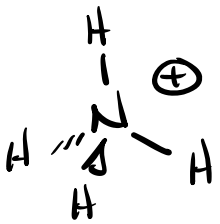




Consult List

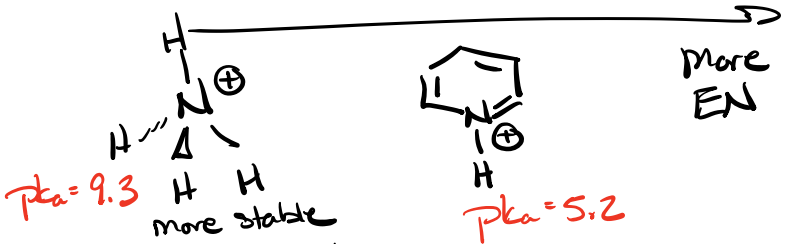
more important than Resonance

Electronegativity / Hybridization	15-20 pka
Resonance	10-15 pka
Size	5 pka
Induction	1-3 pka

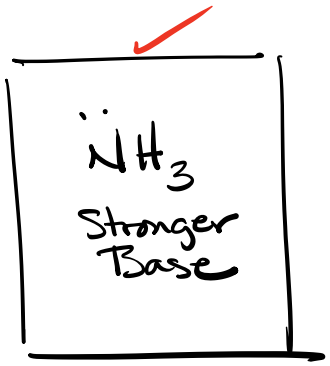


ammonium ion should be more stable than the pyridinium ion due to sp^3 hybridized

more likely to donate e^- — sp^3 → sp^2 → sp — Less likely to donate e^-

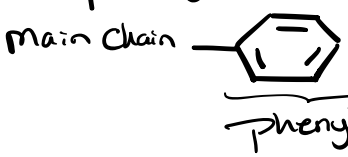


⇒ less reactive
⇒ weaker acid
⇒ The conjugate is a stronger base!



vs

What is the nature of a benzene ring (phenyl substituent)?



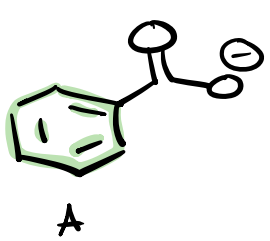
group = substituent

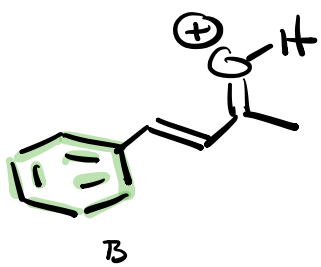
Asking is it EDG or EWG?

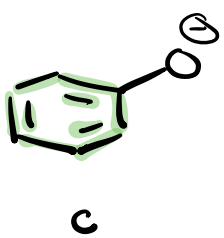
How does it function Resonance or Induction?

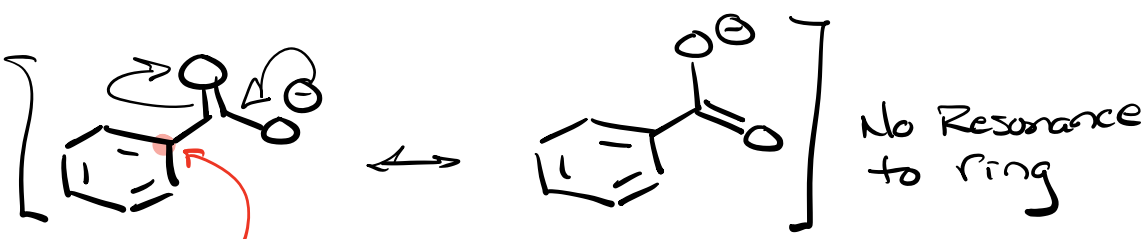
Is it stabilizing or destabilizing?

↖ depends on what it is attached to


A


B

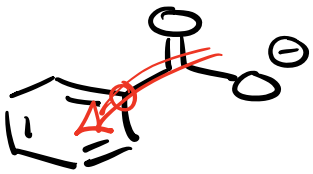

C

A) 

sp^2 hybridized Carbon ≈ Nitrogen EN

pka	60	40	15.7
	C–H	N–H	O–H
	$-\dot{C}-H$	$=C_{H}$	$\equiv C-H$
	sp^3	sp^2	sp
	60	44	26

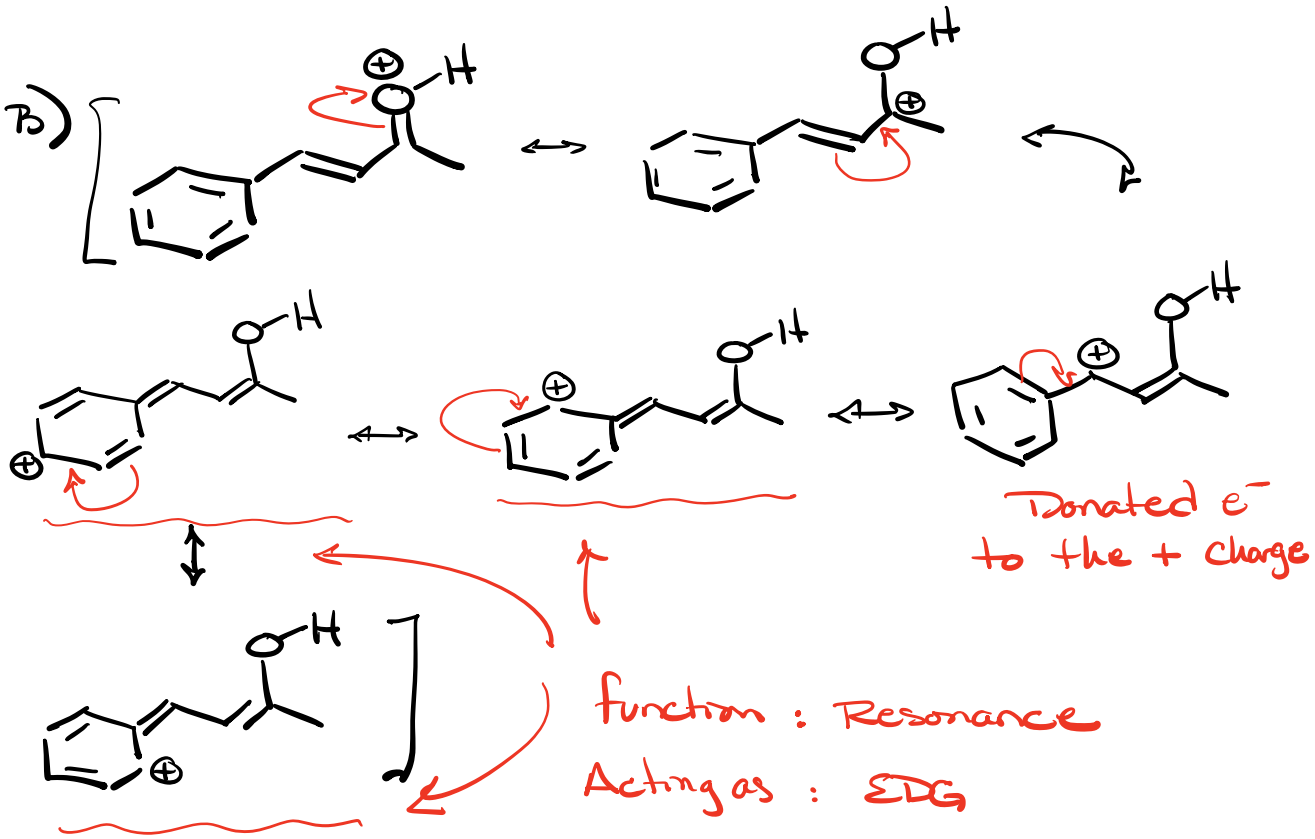
Roughly Equivalent



Mode of Action: Induction

acting as : EWG

effect : Stabilizing to the anion

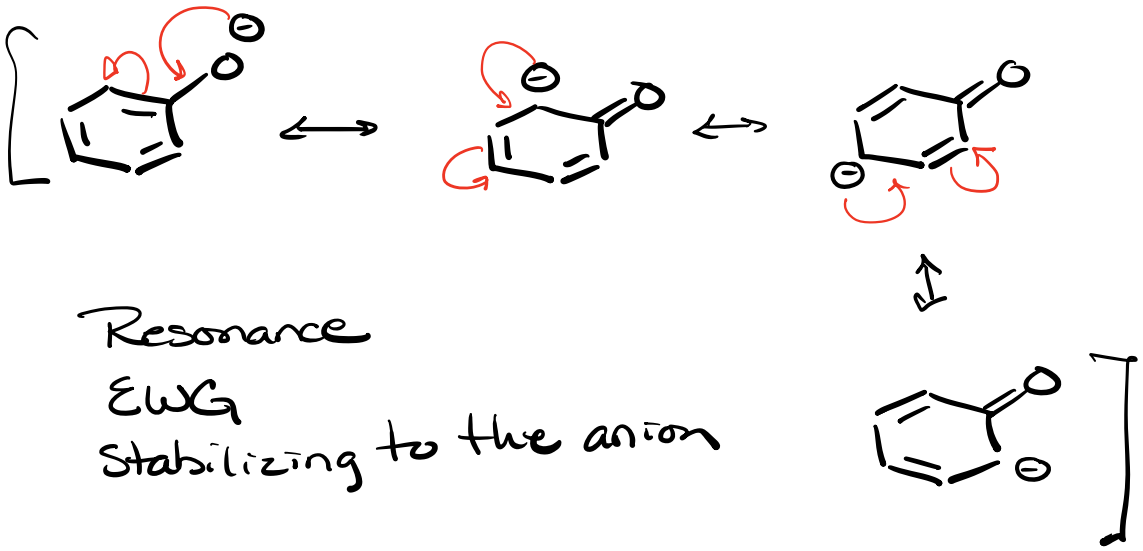


function : Resonance

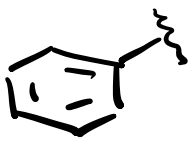
Acting as : EDG

Effect : Stabilizing to the ⊕

c)



Resonance
EWG
Stabilizing to the anion



Inductively withdrawing

Induction
EWG

Resonance Withdrawing

Resonance
EWG

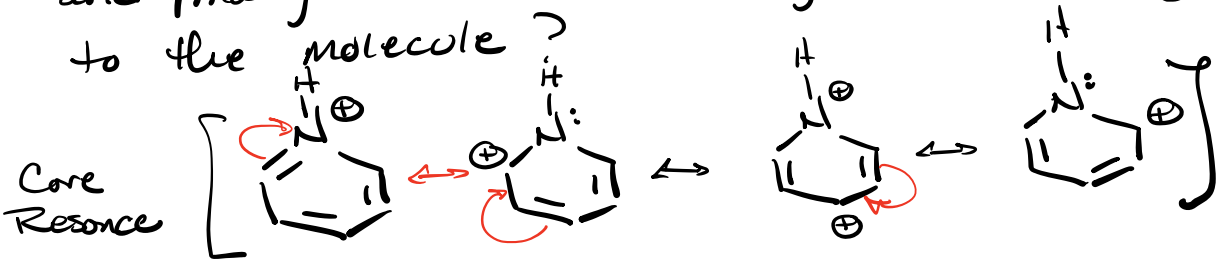
Resonance Donating

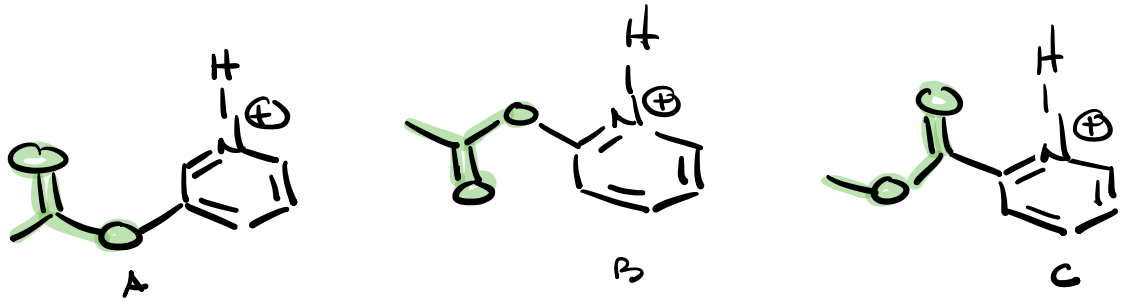
Resonance
EDG

What is the nature of the ester group in the following molecules.

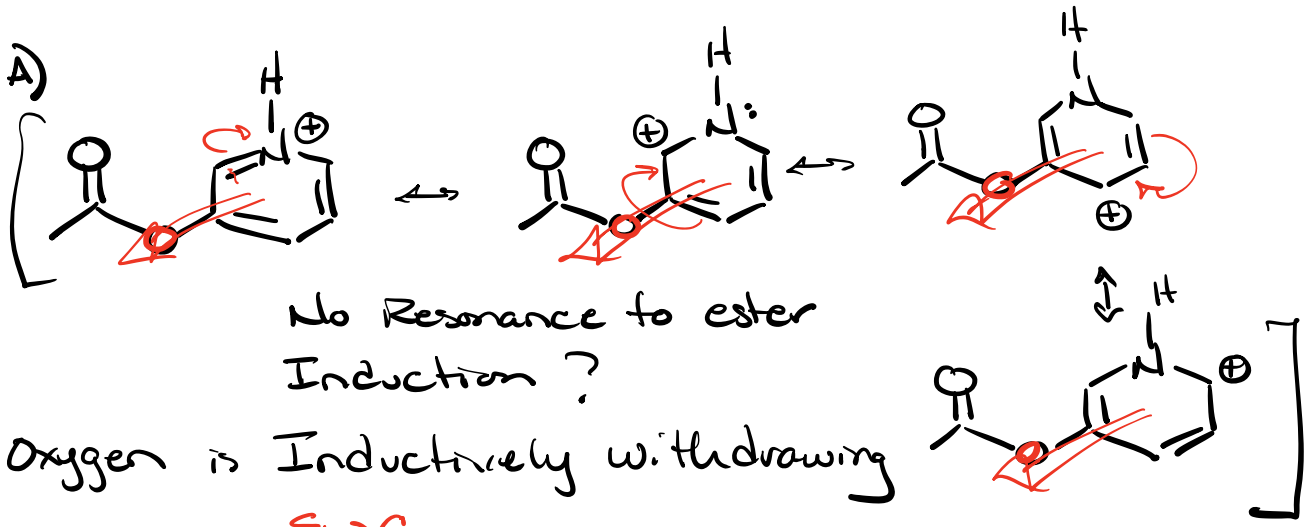
Tell me EWG or EDG, Resonance or Induction and finally if it is stabilizing or destabilizing to the molecule?

Core Resonce





A)



No Resonance to ester

Induction?

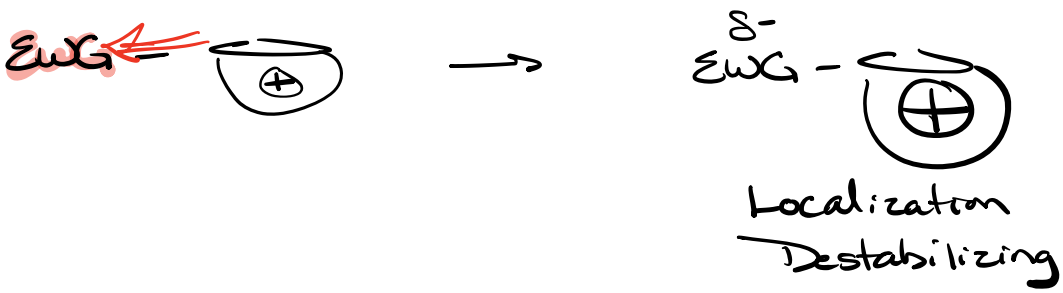
Oxygen is Inductively withdrawing

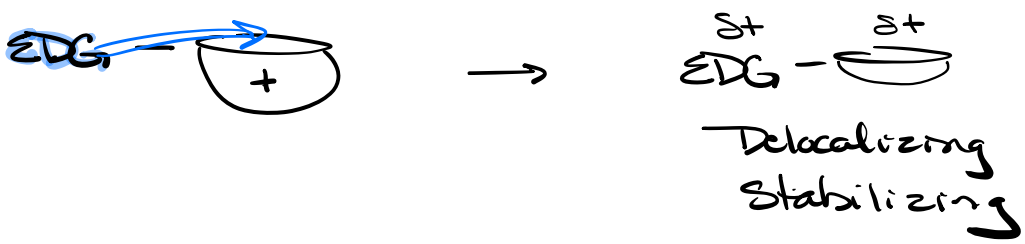
EWG

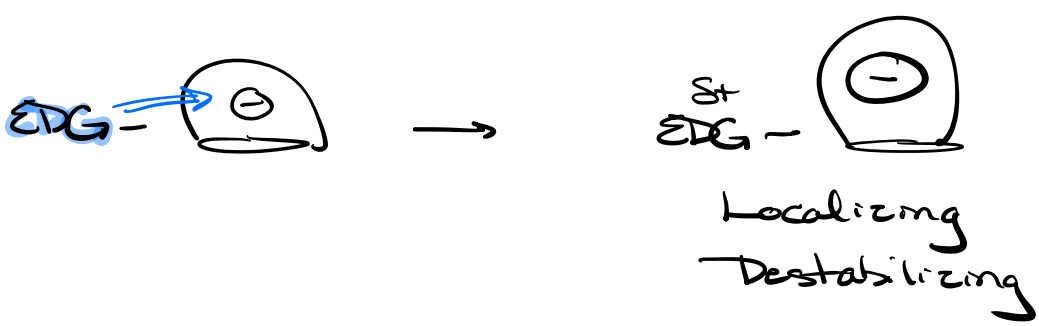
Induction

Destabilizing

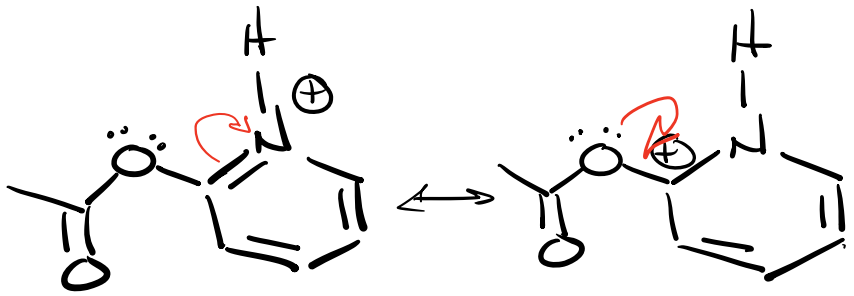
Resonance & Induction



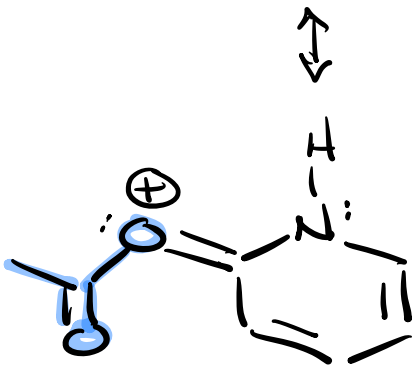




b)

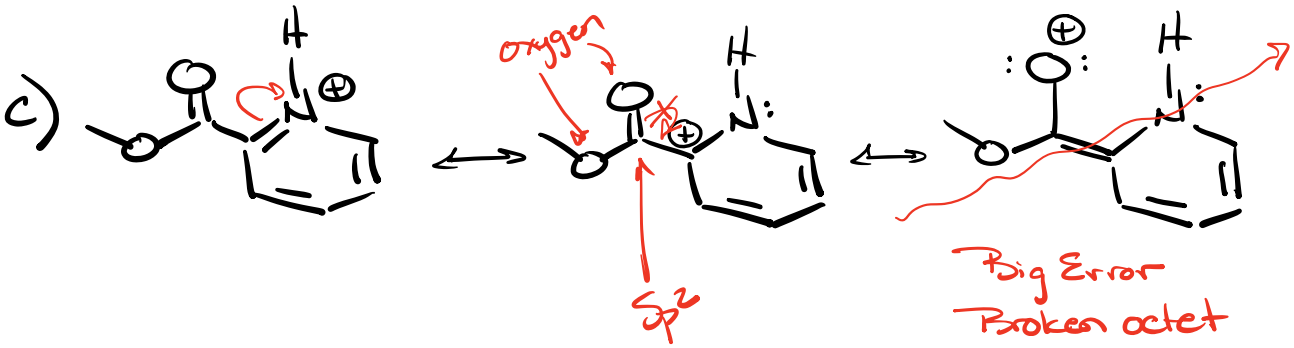


2 more

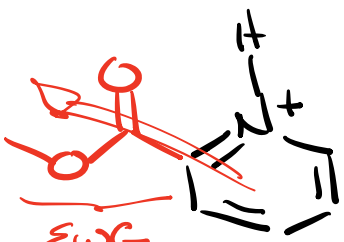


EDG

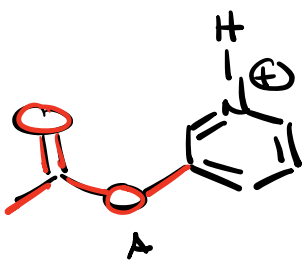
Resonance Stabilizing



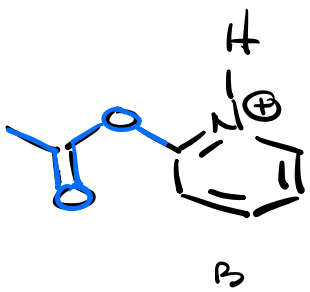
Big EWG
Induction



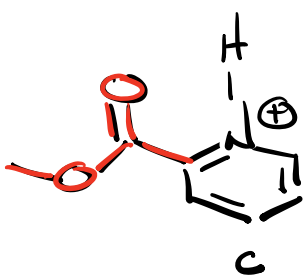
EWG
Induction
Destabilizing



EWG
Induction
Destabilizing



EDG
Resonance
Stabilizing



EWG
Induction
Destabilizing

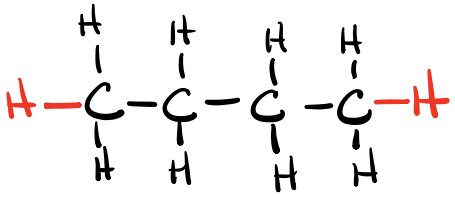
End Chapter 3

Start of Chapter 4

Alkanes

C_nH_{2n+2} saturated

only carbon & hydrogen

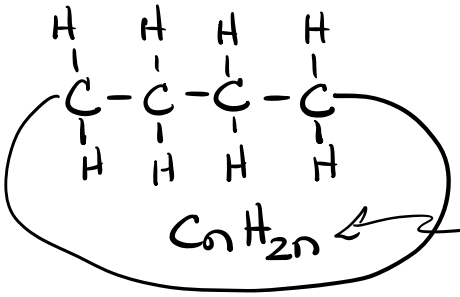


C_nH_{2n+2}

Hydrocarbons w/ Rings

C_nH_{2n} 1 Ring

C_nH_{2n-2} 2 Ring



Isomers

	CH_4	C_2H_6	C_3H_8	C_4H_{10}	C_5H_{12}	C_6H_{14}
# of Isomers	1	1	1	2	3	5

C_7H_{16}	C_8H_{18}	C_9H_{20}	$C_{10}H_{22}$
9	18	75	4,347

There is no formula to calculate the number of isomers.

Isomers of C_6H_{14}

(1)

Conformations
Same connectivity ⇒ just rotation

New isomer