Extra 1

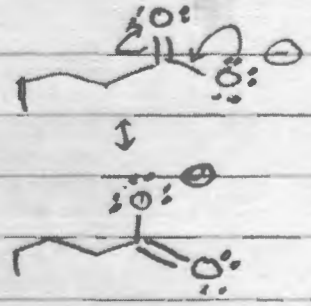
Curved Arrow Conventions in Organic Chemistry

①  ← 2 barbs = 2 e^- movement

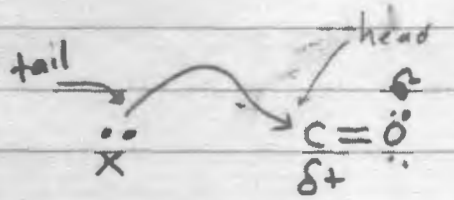
 ← 1 barb

1 e^- moved

Remember Resonance structures



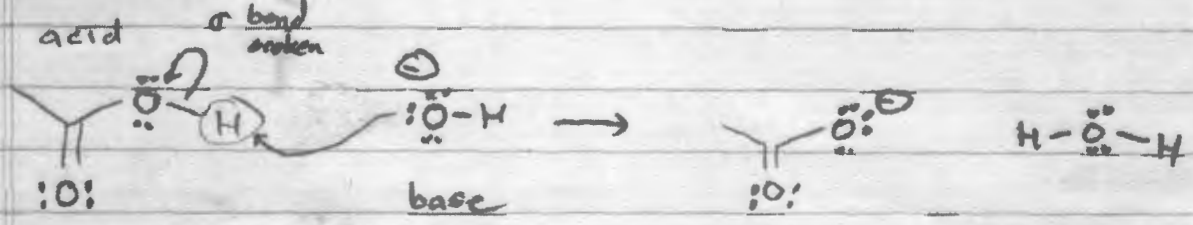
double-barbed arrows used to show movement of e^- pairs

② 

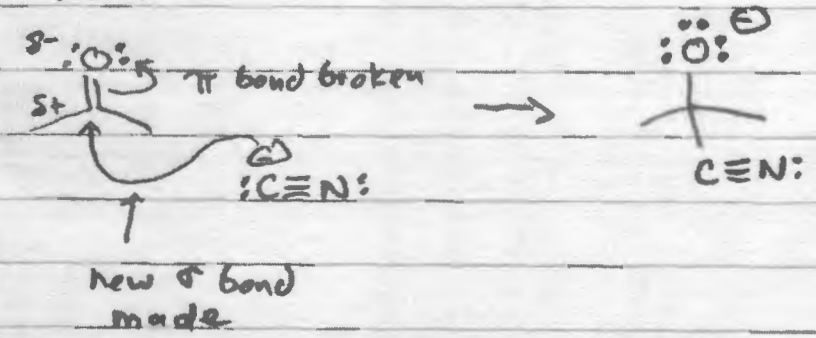
arrow head points to where e^- are going

electron source to electron sink

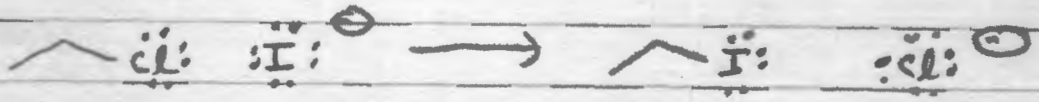
③ If electrons move toward a sink, then an arrow needs to be drawn to show e^- move away. Either a π bond or σ bond is broken in rxn mechanism.



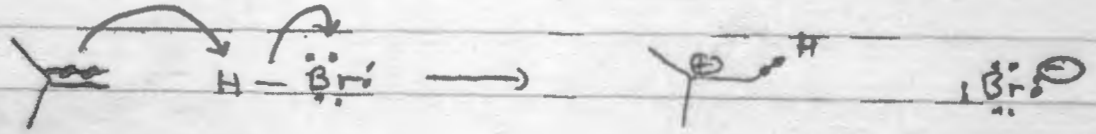
Extra-2



Draw curved arrow to show the mechanism (show the reactants couple)

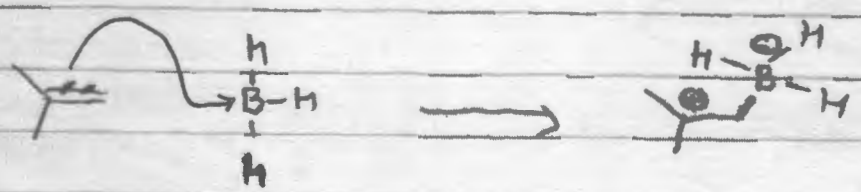


What's happening here?



CIRCLE

Acid	Acid	Conj Acid	Conj Acid
Base	Base	Conj Base	Conj Base



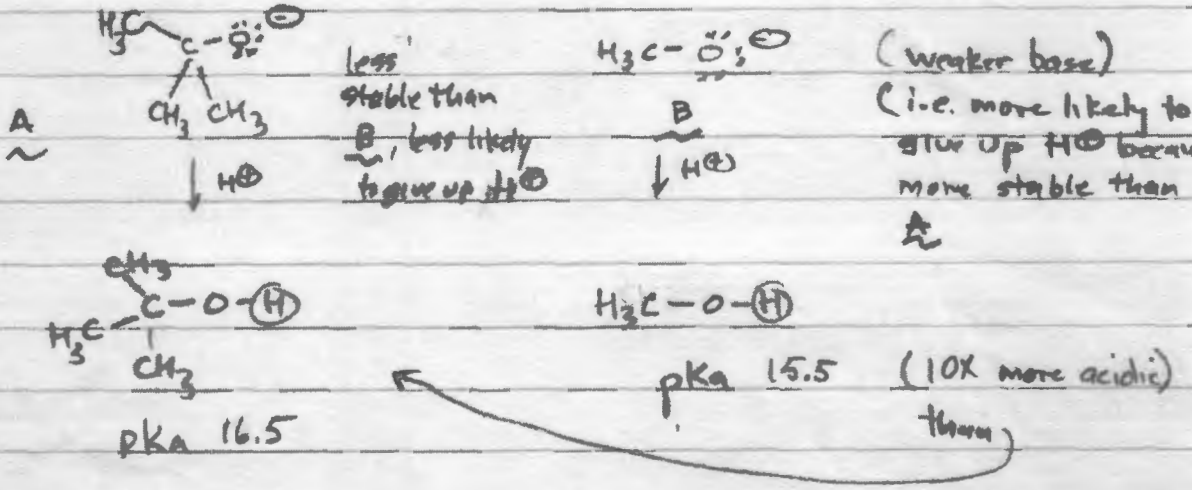
CIRCLE

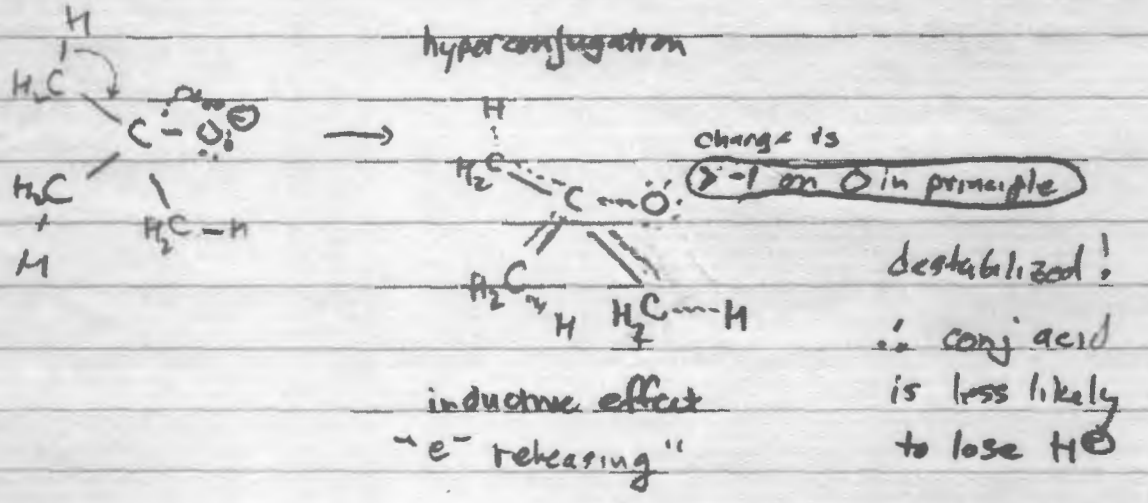
Lewis Acid	Lewis Acid
Lewis Base	Lewis Base

Extra - 3

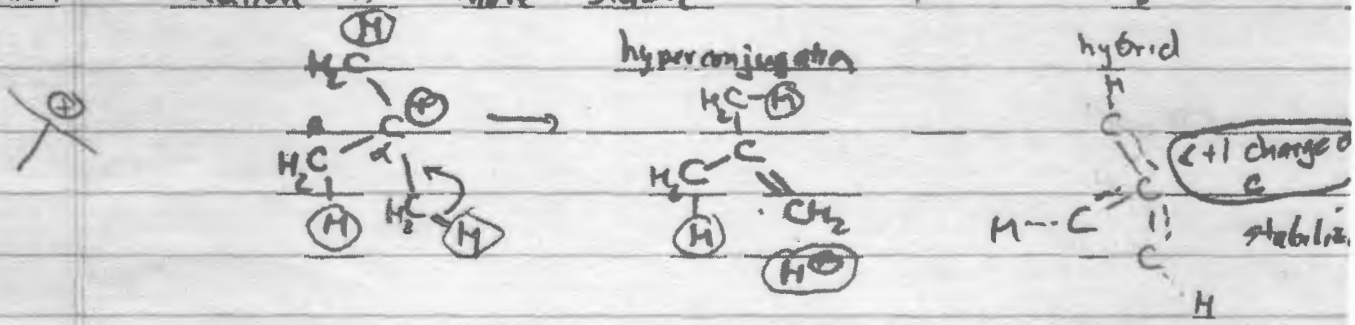
Carbocation Stability

Recall what made A a stronger base than B





Which Carbocation is more stable ⊕ or $H_3C^{\oplus}$

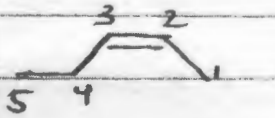


Extra-4

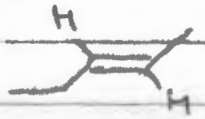
No β carbons can release e^- density to C^+ to stabilize it

Carbocations: Least stable — 1° C^+ — 2° C^+ — 3° C^+ — More stable

Cis/Trans Revisited

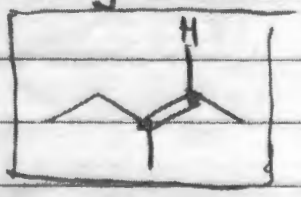


cis-2-pentene



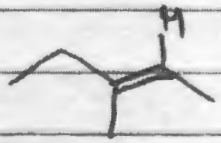
trans-2-pentene

Can you use "cis/trans" for the following?

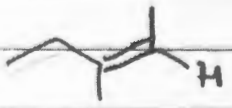


NO! each C of the double bond does not have at most 1 H.

How do you distinguish

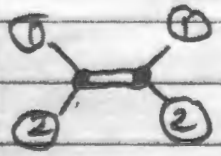


from

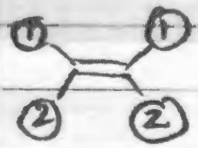


Use E/Z System

↳ same priority rules as those used for S/R configuration assignments: Cahn-Ingold-Prelog

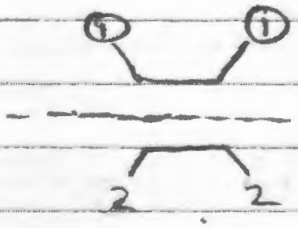


Assign priorities ① and ② to the substituents each atom of C=C holds

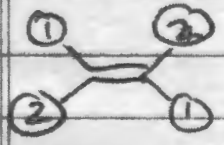


1 gets 1st place
2 gets 2nd place

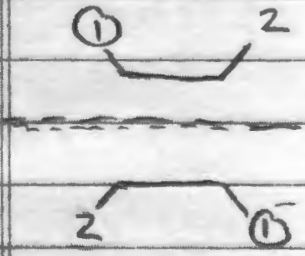
Are the (1)s on same side of double bond



yes! ∴ (Z) ussamen

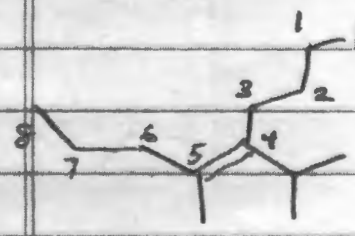


The (1)s are on opposite sides of double bond



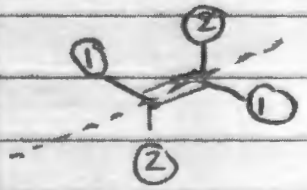
∴ (E) ntgegen

entgegen (in German) = "in opposite"



4-octene
4-isopropyl IUPAC: (1-methylethyl)
5-methyl
1-bromo

(E)-1-bromo-4-isopropyl-5-methyl-4-octene

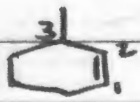


E

Cycloalkenes (Naming)

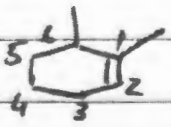
① Ring C=C are # 1 and 2 always

② Substituents are named so they get the lowest # when C=C are 1 and 2



3-methylcyclohexene

Note, there is no need to say 1-cyclohexene because that is implied if C=C gets assigned as 1 and 2

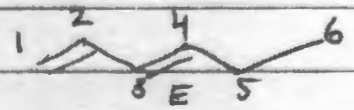


substituent on C=C dictates # of C1, the other C of C=C is #2

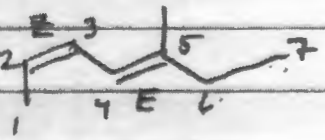
1,6-dimethylcyclohexene

(NOT) 2,3-dimethyl

Polyenes



1,3-hexadiene

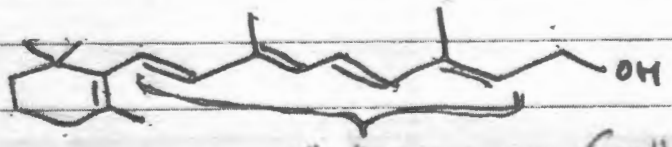


(2Z, 4E) - 5-methyl-2,4-heptadiene

Index of Hydrogen (H_2) Deficiency

$C_6H_6N_2O$ given but don't know structure

Vitamin A



all-trans or (all E)

elemental analysis
$C_{20}H_{30}O$

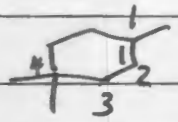
What is IHD?

⇓

Measures the # of π-bond and/or rings in a molecule

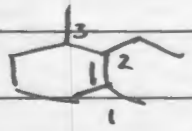
Coupled w/ spectroscopic data can determine structure

Cycloalkenes



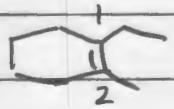
C1 has a substituent making in #1

1,4,4-trimethyl



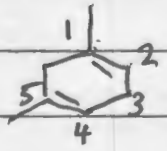
substituents on C=C makes both able to potentially be #1, but lowest numbering for the substituents makes the carbon attached to the $-CH_3$ #1 and the one attached to $-\!\!\diagup$ #2

2-ethyl-1,3-dimethyl-cyclohexene



alphabetically break the tie for carbon #1
Ethyl beats Methyl

1-ethyl-2-methyl



1,5-dimethyl-1,4-cyclohexadiene