Organic Chemistry F17
Ch 3 Study Exercises

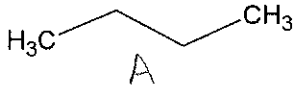
Name Key

1. Define Brønsted Acids and Bases and differentiate from Lewis acids and bases.

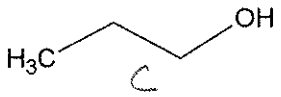
Brønsted base accepts H^+ Lewis base donates e

Brønsted acid donates H^+ Lewis acid accepts e

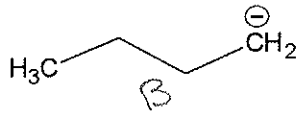
2. Explain why the alcohol is the stronger acid. Use the conjugate base in your reasoning.



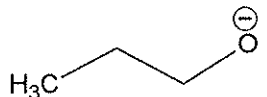
A



C



B



D

The carbon on B is less stable than the O on D (because O is more electronegative and likes having e). Therefore B wants a H more than D, so B is a better base (beggar). Therefore A is a weaker acid.

3. What are the four things to consider when predicting acidity? Provide an example for each and explain.

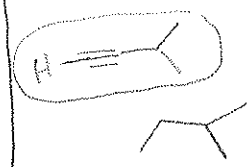
Atom NH_3 vs OH_2

- same row
  ↑electronegative, ↑acidic
- same group
  ↑size ↑acidic (down the group) SH_2 vs OH_2

Resonance
↑resonance ↑acidic

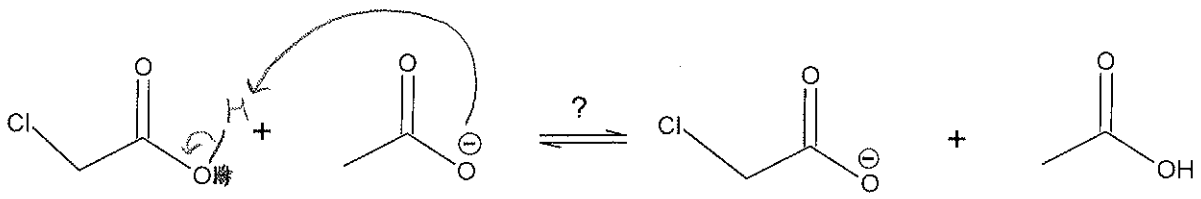
Induction
↑induction ↑acidic

Orbitals
$sp > sp^2 > sp^3$
acidic



4. For the following reactions,
   i. determine which acid is more acidic and explain why
   ii. draw a mechanism (curved arrows), and
   iii. predict whether the reaction favor the right or left under equilibrium conditions

a)



more acidic because of induction

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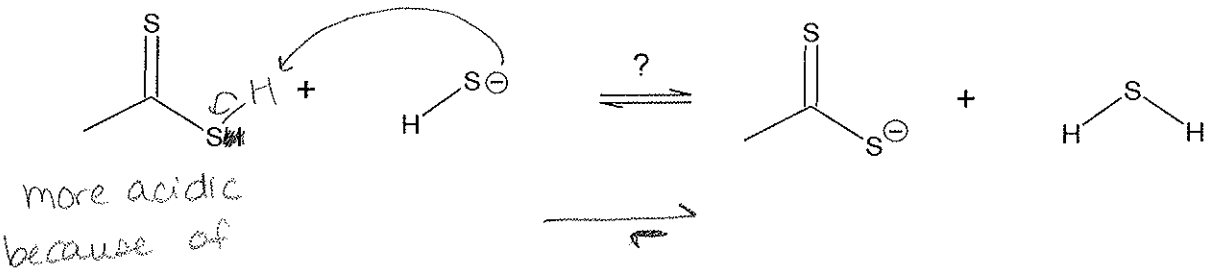
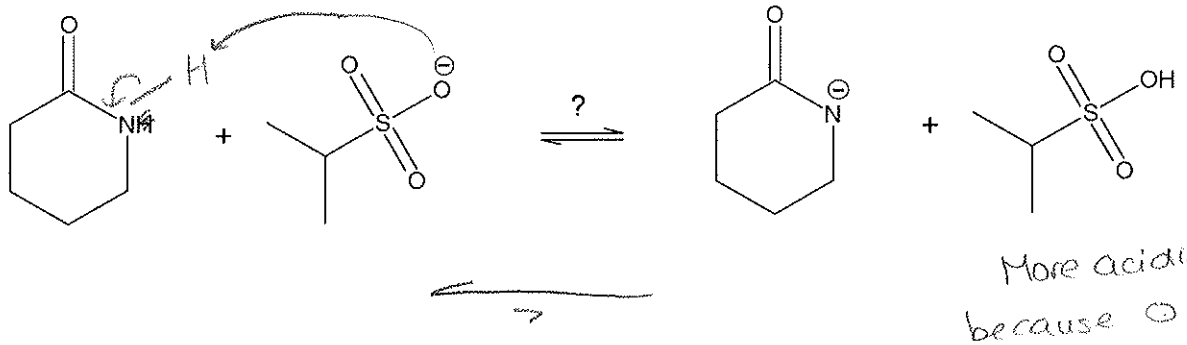
b)



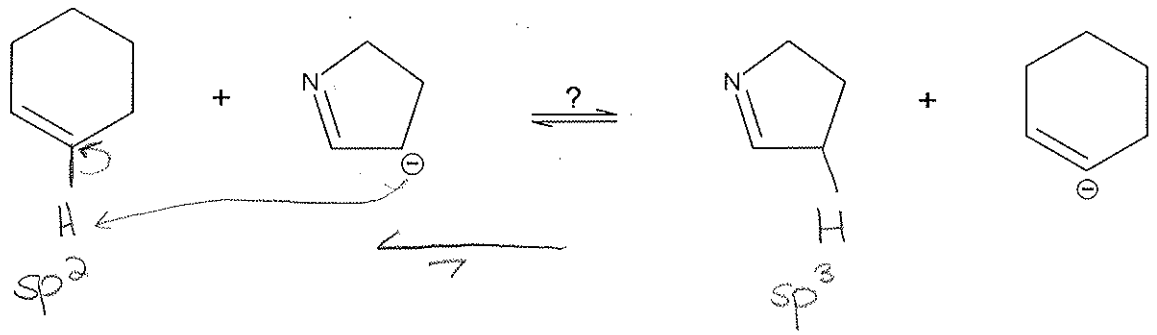
more acidic because of resonance

c)

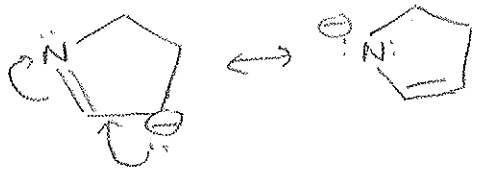


More acidic because O is more electronegative than N

d)



Resonance



But! more acidic because of resonance