Announcements

- Peer Tutor Practical Review Sessions!
  - Fri, March 6, 6-8 PM, ELH 100
  - Tues, March 10, 7-9 PM, ELH 100

- Make sure you read and follow report guidelines!

- This is your last *required* lab lecture. Week 10 optional. Will be available here for questions.
Today’s Order of Events

1. Announcements
2. General question time
3. Description of practicals + tips
4. 15 min to work on a practice question with team
5. Regroup with full class to go over practice question
6. Spec problem solution
How Practicals Work

- Will sign up for time with TA (first half or second half), 1 hr 50 min.
- When you are actually taking your practical, it goes like this:

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40 min @ “wet station”

40 min @ bench
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OR

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40 min @ bench

40 min @ “wet station”

30 min @ bench
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Rooms for Practicals

***You might not be in your regular room.
(Exception: 463)

~15 min before your exam time, go to stockroom & check for TA’s name/room assignment!
What’s Will Practicals Test? (1)

- Basic techniques
  - One of these: MP, TLC, extraction, recrystallization
  - Solutions, waste containers, glassware you would normally get from stockrooms - all at station
  - Will have to go get general glassware
- Mechanism
  - Something we did this quarter, but different molecules
- Stoichiometry
  - Your basic calculations
What Will Practicals Test? (2)

- **Spectroscopy**
  - Given IR, $^1$H NMR, $^{13}$C NMR
  - Determine structure (fill in table like week 1 lab)
  - Not giving you IR frequency or NMR chemical shift tables (See handout that goes with spec videos)

- **Critical thinking**
  - Testing your understanding and analysis skills!
  - Explain an outcome. Figure out what went wrong. Etc.
  - **Remember: back up claims with evidence!**
Tips for Practical Success

- For techniques: know how and why, know basic procedure, DON’T memorize quantities
- If you think something is wrong or missing, raise your hand and tell your TA!
- Practice spec problems without tables in front of you
- Read and follow instructions!
Last Problem!

Vivi has run a bromination reaction of trans-cinnamic acid, but she has determined that her results are unclear. The melting point of the recovered solid was 118-125 °C. She thinks that she might have a mixture of anti-addition and syn-addition products (mp 202-204 °C and 93.5-95 °C, respectively). Her friend, Calvin, thinks that she might have unreacted starting material instead (mp 133 °C). Calvin suggests that she use $^1$H NMR to determine whether she has bromine addition products or starting material. Vivi argues that $^1$H NMR won’t help in this scenario because bromine atoms are not visible in $^1$H NMR spectra. Who is correct about the use of $^1$H NMR and why?
C₁₄H₁₄O₂ - unsat. = 8

- Broad peak = OH
- Can't be COOH (δ would be 10-12)
- Lots of aromatic H
  - Too many for just one ring!
  - Also consider other conj C=C
- iPr group!
  - Maybe next to Ar or C=O
  - δ too low for next to O

1H (s)
1H (d)
1H (dd) (dd)
1H (s)
1H (sept)

PPM
$C_{14}H_{14}O_2$ - 13 individual C signals here!

Can’t be COOH or aldehyde
probably not ester
**ketone!

C=O

These go with the Ar
(or highly conj. C=C-H
in H NMR)

C’s in iPr group
~20 ppm = 2 equiv C’s
Close Student Answers

- Ring system close
- Yes - iPr group, but not correct placement
- Not a carboxylic acid

- Yes - ring system
- Yes - iPr group, but not correct placement
- No - aldehyde
- Splitting patterns for Ar-H and # Ar-H signals don’t work
The Correct Structure(s)

Correct Structure

Also Accepted

2 singlets
2 doublets
2 doublets of doublets

These could be differentiated by chemical shift differences in Ar-H signals.
You would NOT be expected to know this!
Now Predict IR

What peaks would you expect to see in the IR? (Just the main important ones. You may choose more than one.)

A. O-H stretch alcohol
B. O-H stretch carb. acid
C. sp C-H
D. sp\(^2\) C-H
E. sp\(^3\) C-H

F. Fermi doublet
G. C=O (sat.)
H. C=O (conj.)
I. C=C