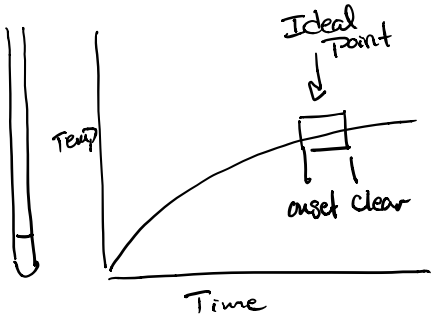
Lab #8 Boiling Point & FTIR

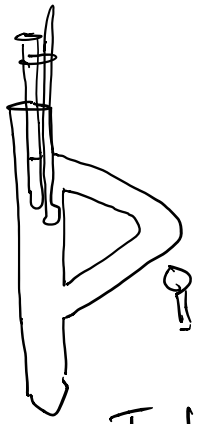
Boiling Point



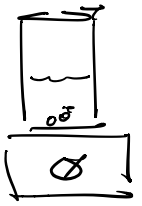
Boiling point = $P_{vap} = P_{atm}$

Sharp point

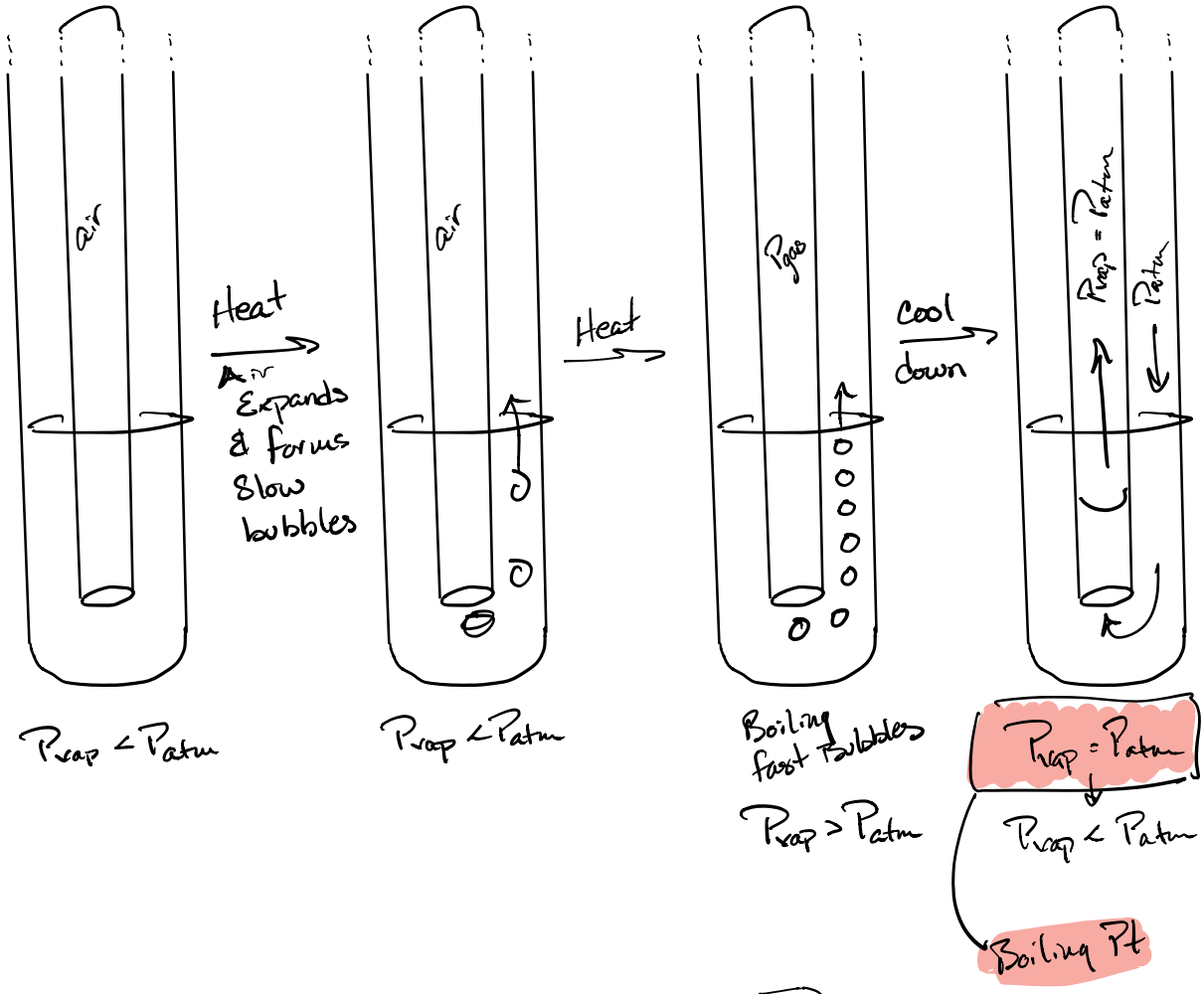
MP Range = (onset − clear point)

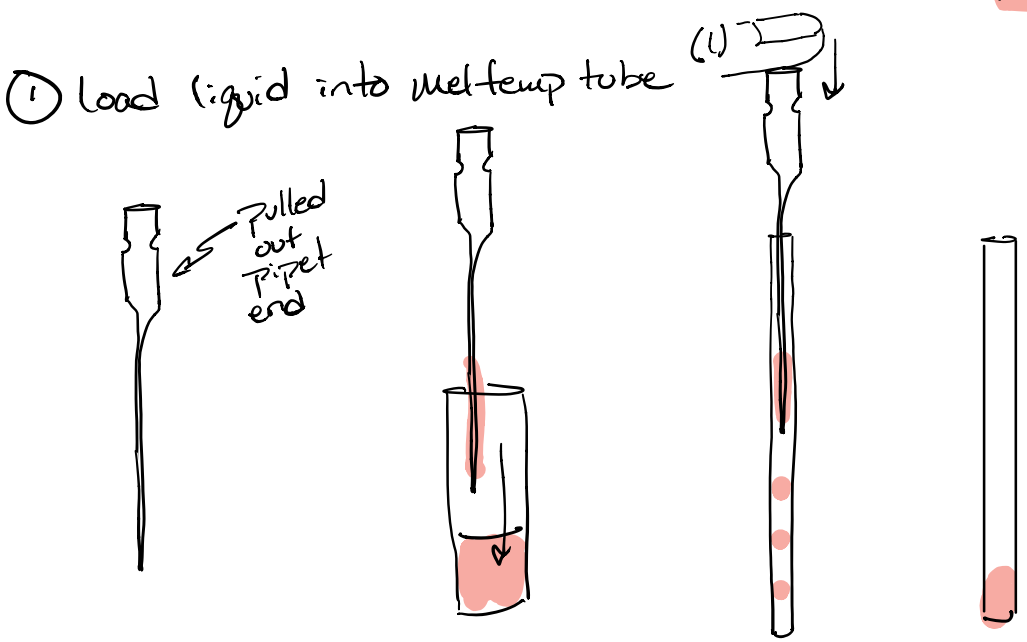


Too large in scale

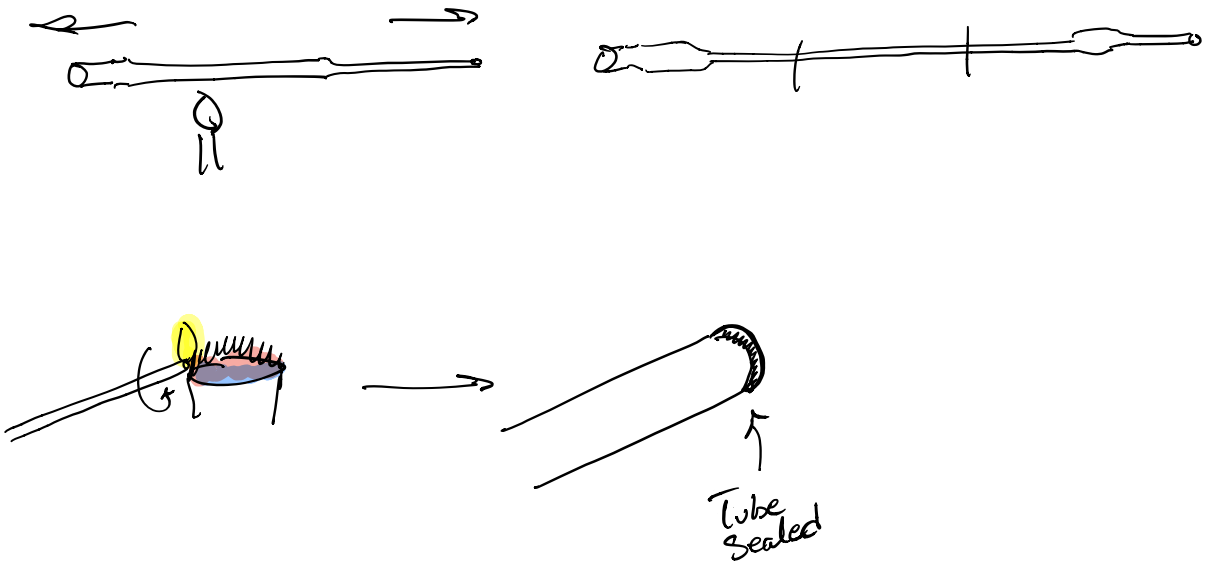


+ Meltemp

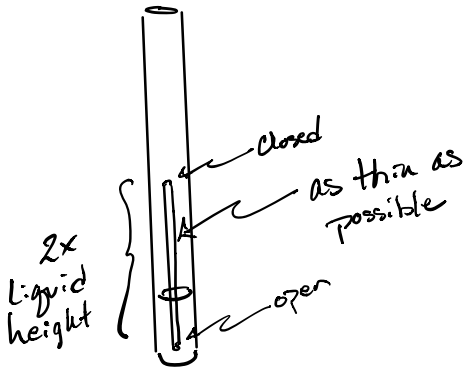

air
Heat
Air Expands & forms slow bubbles
air
Heat
Pgas
Cool down
Pvap = Patm
Patm
Pvap < Patm
Pvap < Patm
Boiling fast bubbles
Pvap > Patm
Pvap = Patm
Pvap < Patm
Boiling Pt

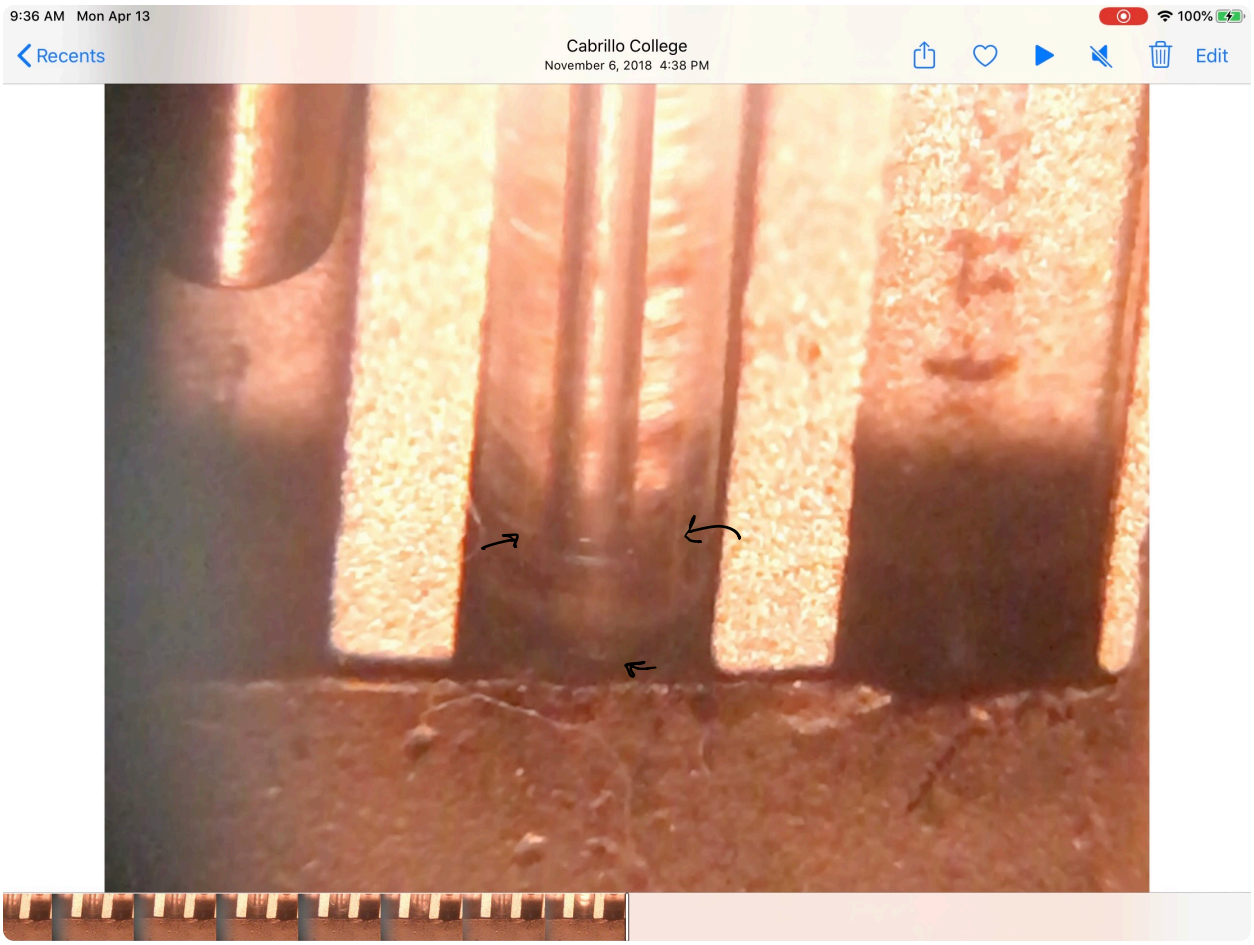

1 Load liquid into Mel-temp tube
(1)
Pulled out Pipet end

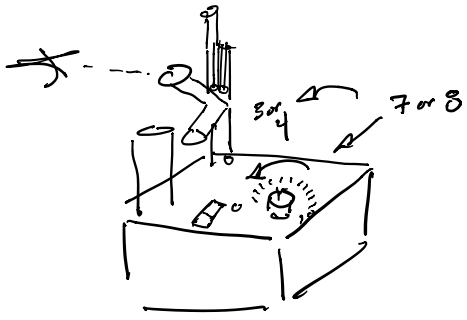
② Make the dumbell



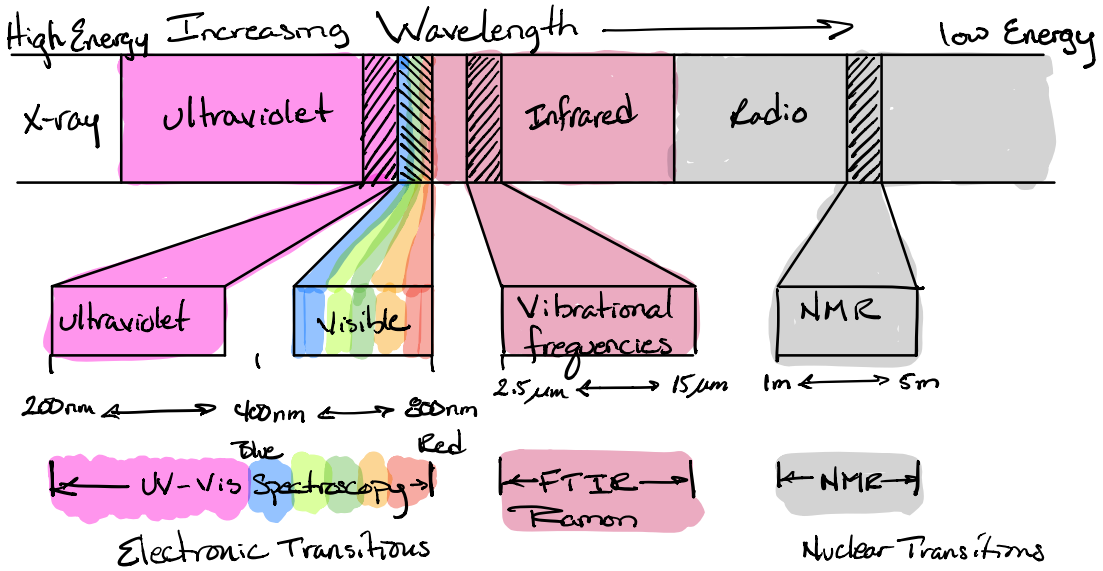
③ Load dumbbell




9:36 AM Mon Apr 13
100%
Recents
Cabrillo College
November 6, 2018 4:38 PM
Edit


5 or 4
7 or 8

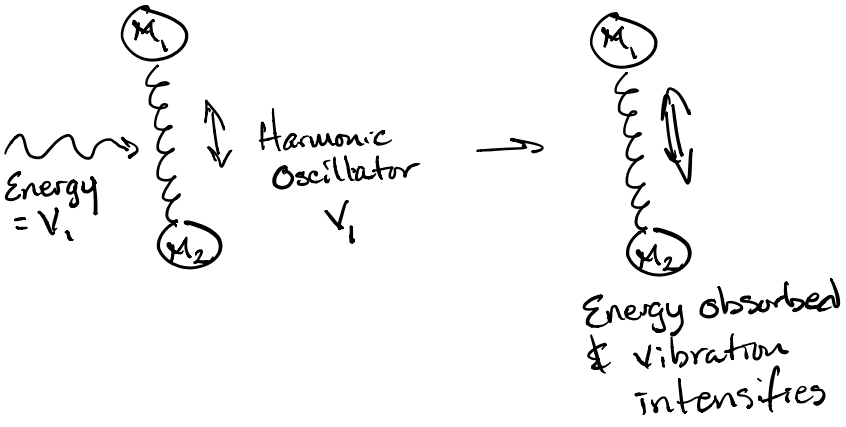
Infrared Spectroscopy (IR or sometime FTIR)



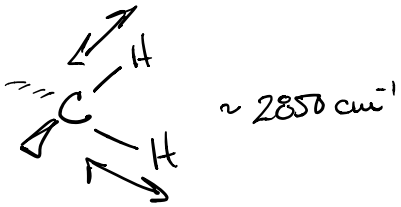
Wavelength = $\mu m = 1 \times 10^{-6}$ m

Wavenumber = $cm^{-1} = \frac{1}{\mu m} \times \frac{10{,}000\ \mu m}{1\ cm} = \frac{1}{\mu m} \times 10{,}000$

Vibrational frequencies

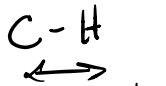


Simple Vibrational frequencies



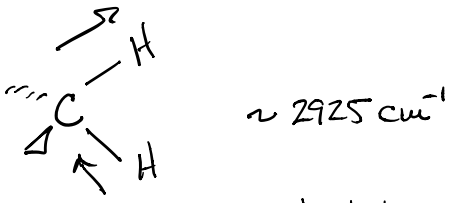
$\sim 2850\ cm^{-1}$

Symmetric Stretch



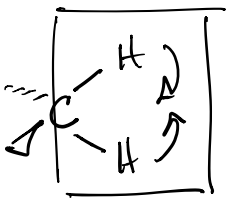
Stretch

Bending



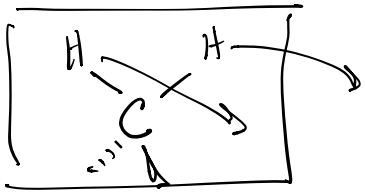
$\sim 2925\ cm^{-1}$

Asymmetric Stretch



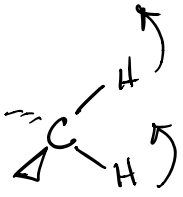
Scissoring

$1450\ cm^{-1}$



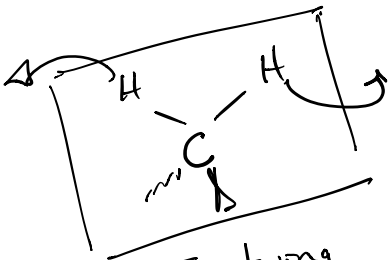
Wagging

$\sim 1250 cm^{-1}$



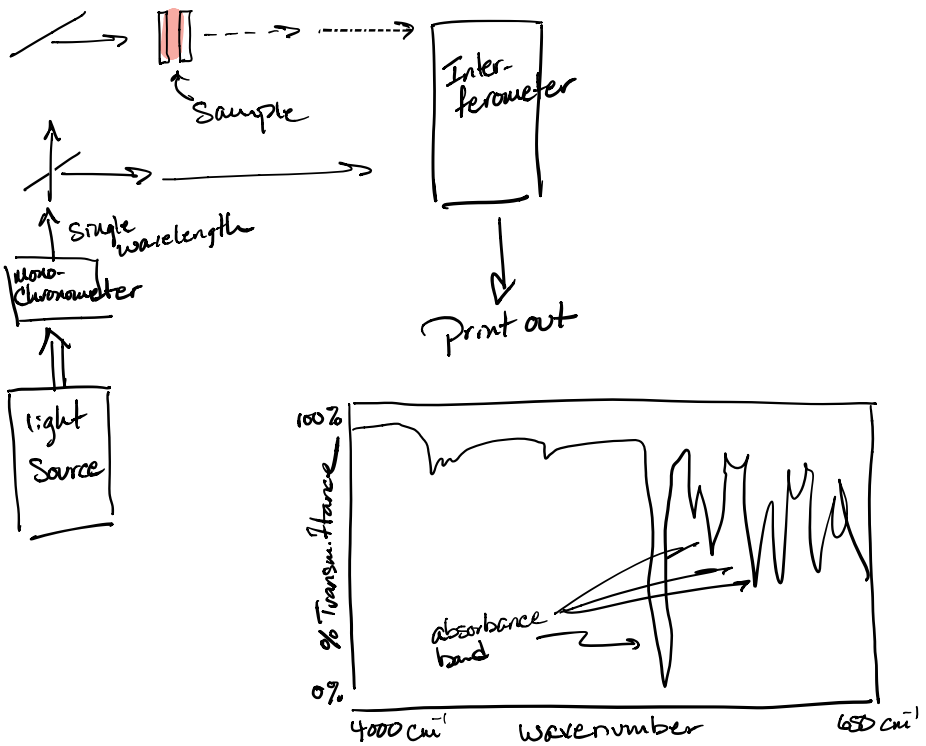
Rocking

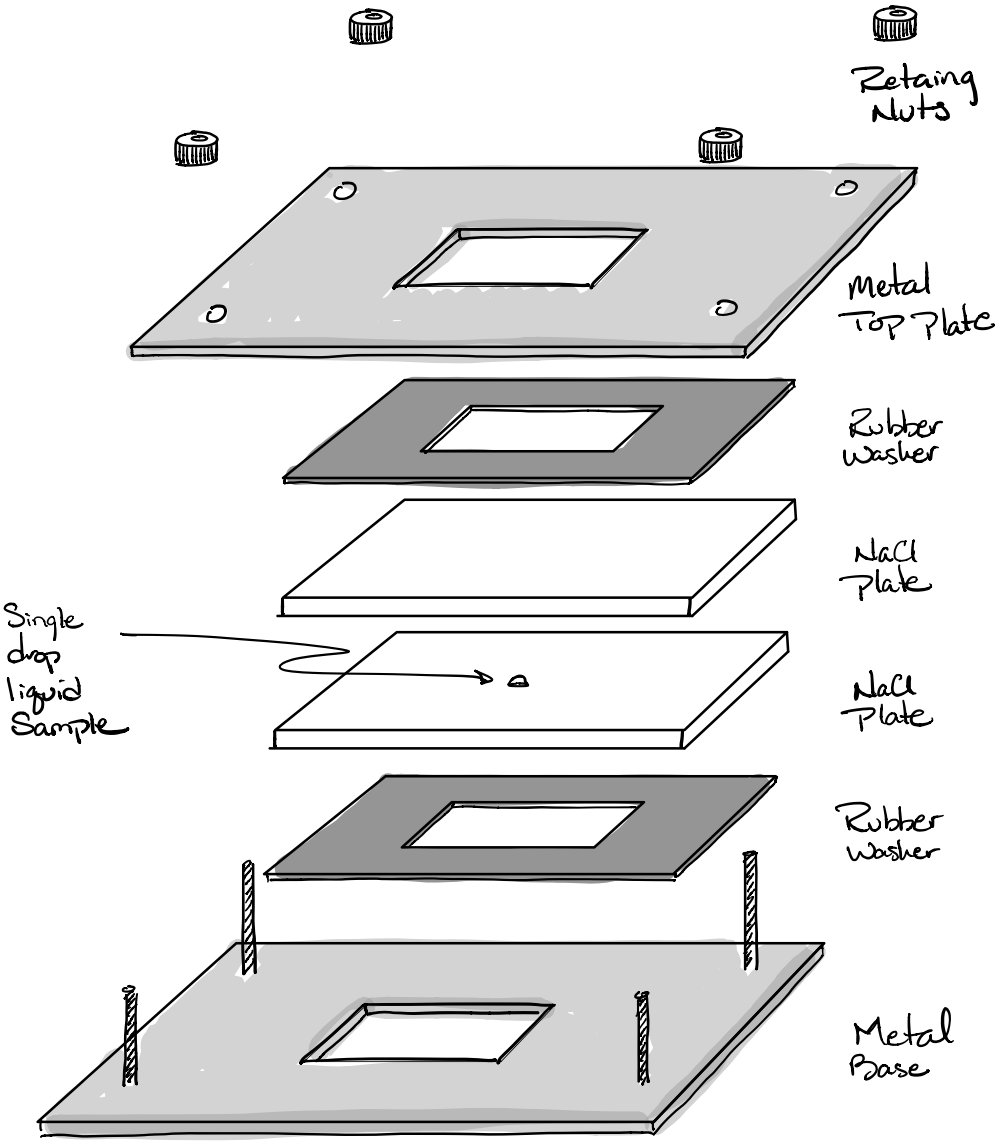
$\sim 750 cm^{-1}$

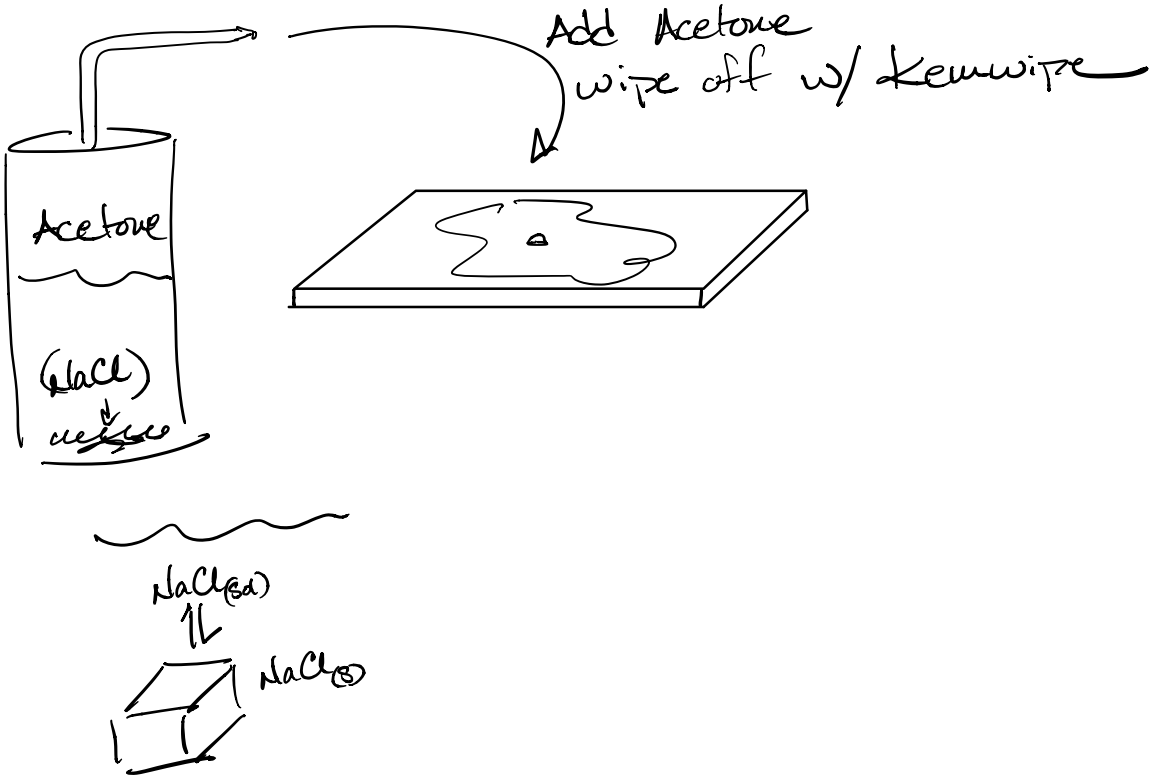


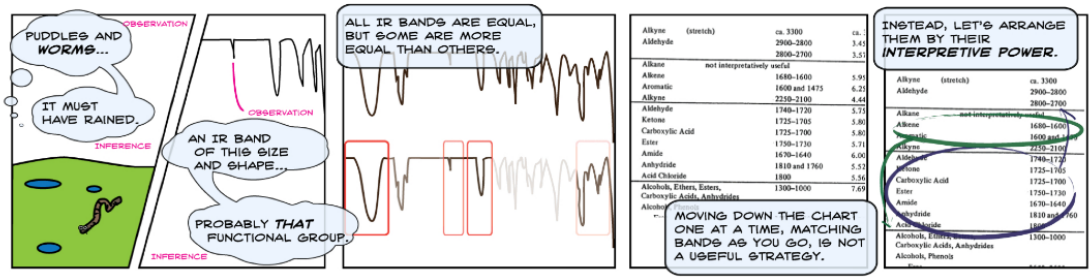
Twisting

$\sim 1250\ cm^{-1}$

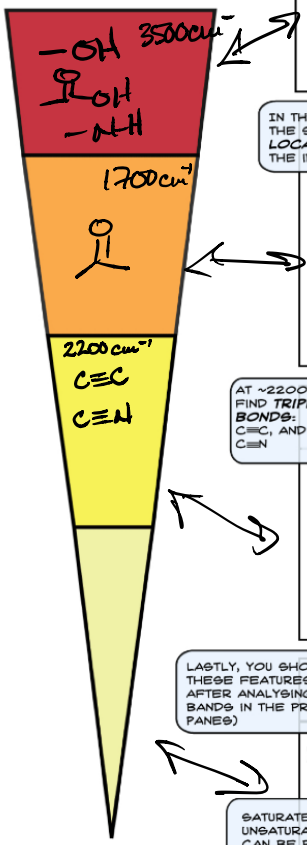

Sample
Inter-
ferometer
Single
wavelength
Mono-
Chromometer
Print out
light
Source
100%
% Transm. Hance
0%
absorbance
band
4000 cm⁻¹
wavenumber
650 cm⁻¹

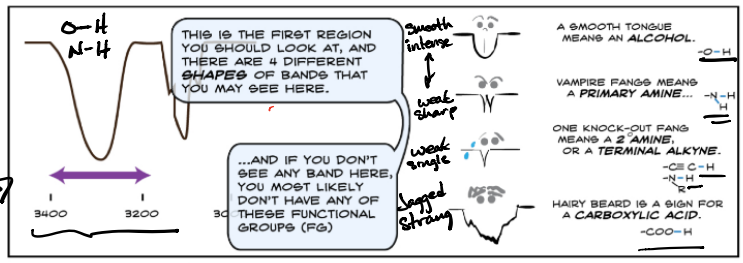

Retaing Nuts
Metal Top Plate
Rubber Washer
NaCl Plate
Single drop liquid Sample
NaCl Plate
Rubber Washer
Metal Base

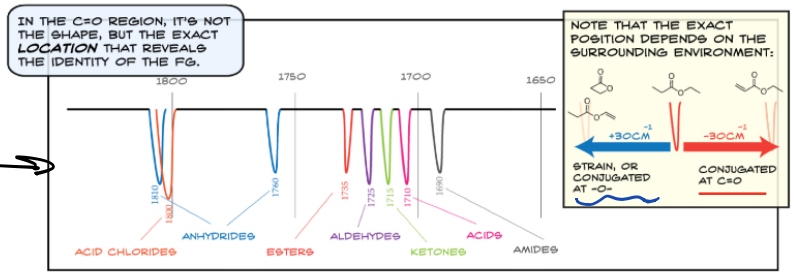

Add Acetone
wipe off w/ Kemwipe
Acetone
(NaCl)
NaCl(aq)
NaCl(s)

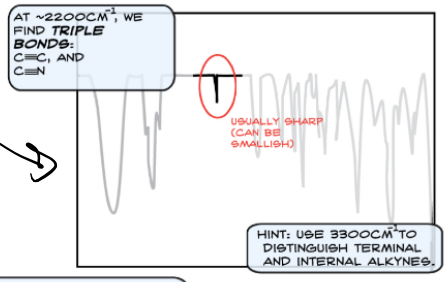


GREAT INTERPRETIVE POWER



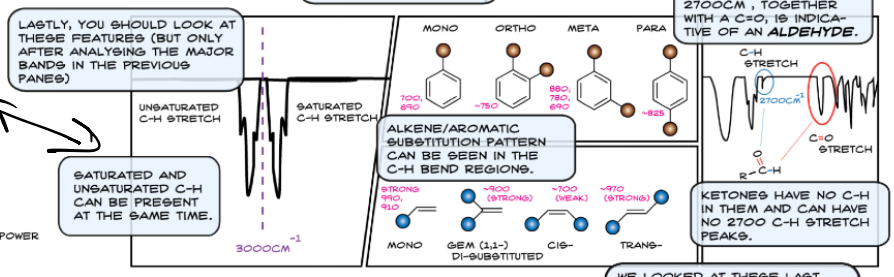






Interpreting IR spectra

JON - JKWCHUI@UVIC.CA

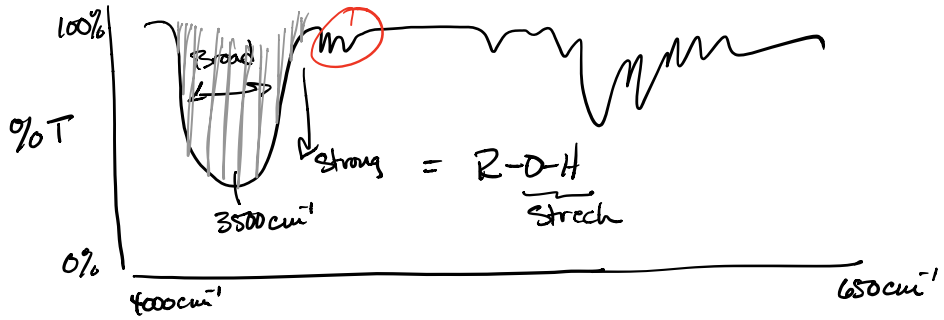


WE LOOKED AT THESE LAST BECAUSE THEY CAN BE AMBIGUOUS TO INTERPRET, OR THEY HAVE ONLY A NARROW NICHE OF USEFULNESS.

NOTES

** IF YOU'RE NOT SURE WHAT THE DIFFERENCE BETWEEN AN ACID AND AN ALCOHOL IS, DO THE QUICK "FUNCTIONAL GROUP IDENTIFICATION" EXERCISE.

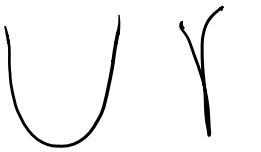
** ...IF YOU HAVE ONE FG. TWO 2°AMINE WOULD LOOK LIKE A 1 AMINE.

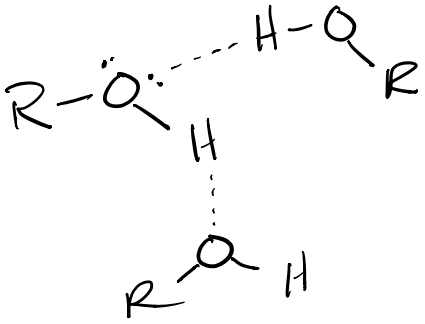


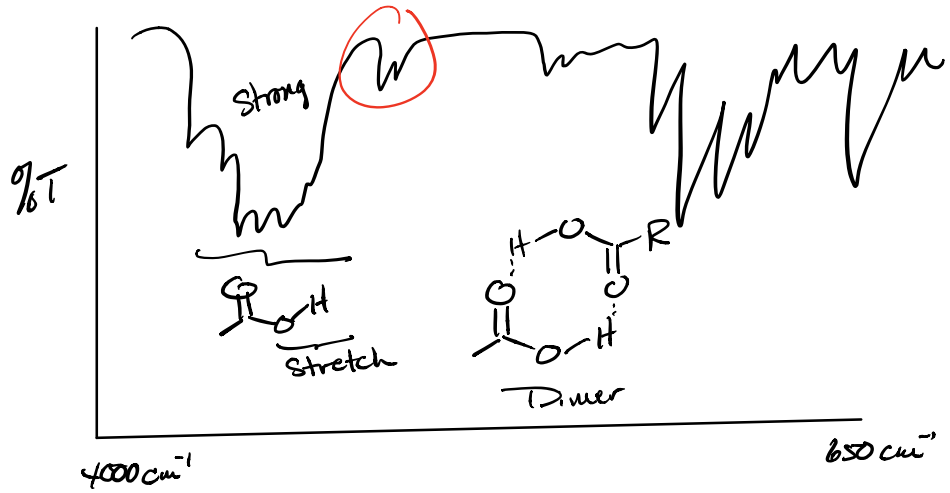
Strong 0-20 %T

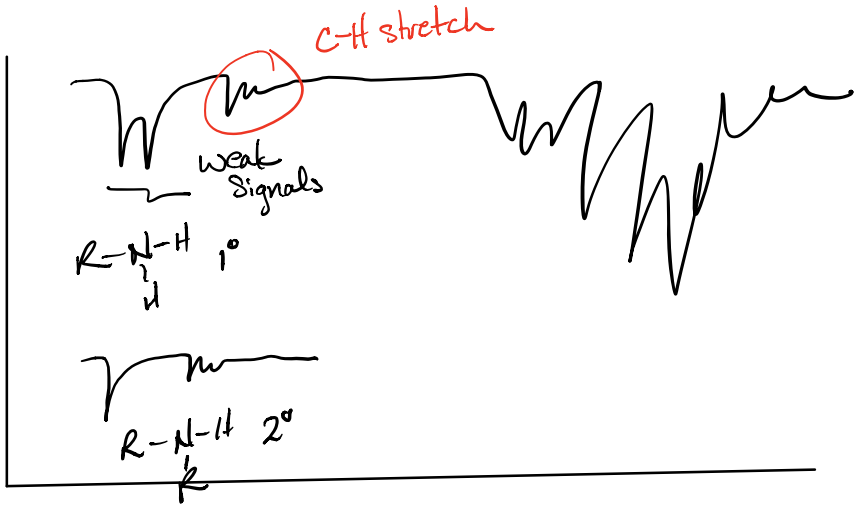
Med 20-70 %T

Weak 70%-100% T









1700 cm^{-1} carbonyl Group