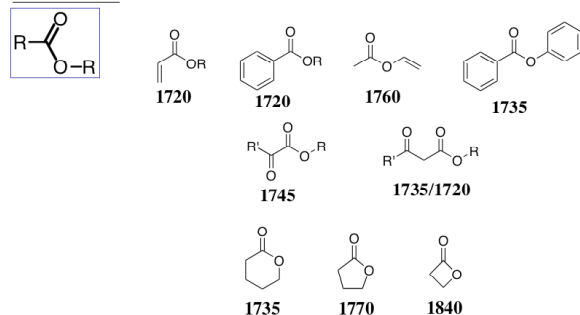
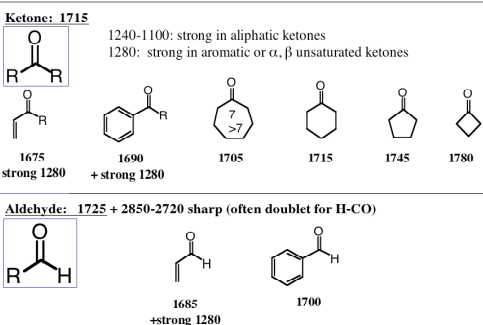


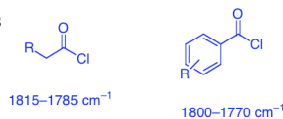
Ester: 1735 + two at 1300-1050



Carbonyl Compounds: 1870-1600 cm^{-1} (strong absorbance)

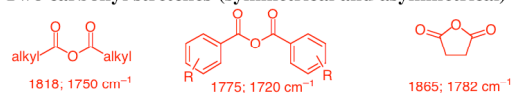


Acid Halides



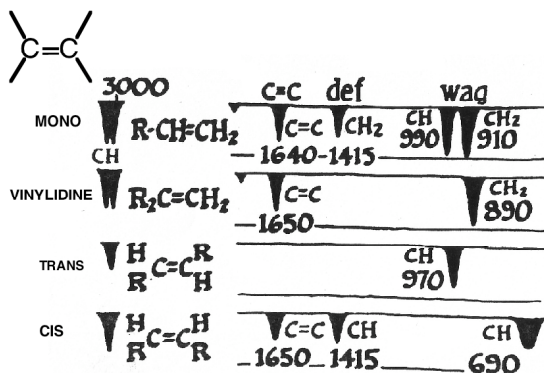
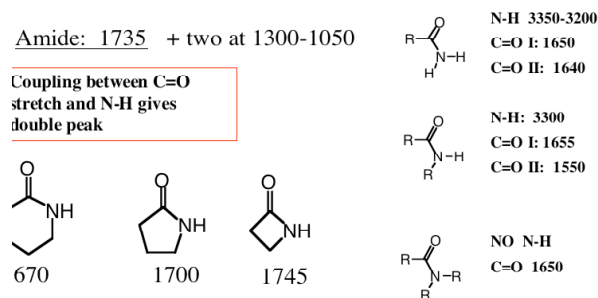
Anhydrides

• Two carbonyl stretches (symmetrical and asymmetrical)

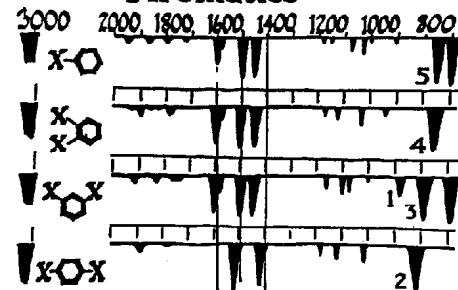


Amide: 1735 + two at 1300-1050

Coupling between C=O stretch and N-H gives double peak



Aromatics



3100-3000 C-H stretch and overtones
2000-1660 group overtones
1600, 1580, 1500, 1450 in plane vibrations (not seen with all substitutions)

Alcohols:

R-O-H RO-H 3640-3600 sharp if not hydrogen bonded/solvated
3600-3500 m hydrogen bonded or solvated
C-OH 1° = 1050, 2° = 1100, 3° = 1150

C≡N (nitrile) 2250 m-s

C≡C-H Alkyne C≡C-H 3300 strong and sharp
C≡C-R - C≡C- 2260-2190 very weak or absent

R-O-R Ethers C-O-C 1150-1070 s

Nitro: 1660-1500(s) asymmetrical stretch
390-1260(s) symmetrical stretch

Amines

- NH stretching
 - in dilute solution, primary amines (RNH_2) display 2 bands, near 3500 and 3400 cm^{-1} . These represent 'free' asymmetrical and symmetrical stretches.
 - in dilute soln, secondary amines (R_2NH) display one band near 3350-3310 cm^{-1} .
 - weaker and sharper than OH

neat primary aliphatic amines (alkylNH_2) absorb at 3400-3300 and 3330-3250 cm^{-1} . Aryl NH_2 absorb at slightly higher frequencies.

Alkynes

- C≡C stretch: weak absorption at 2260-2100 cm^{-1}
 - not observed for symmetrical alkynes (v. weak for 'pseudo' symmetric alkynes)
 - terminal alkynes ($\text{R-C}\equiv\text{C-H}$) absorptions are stronger than internal ($\text{R-C}\equiv\text{C-R}$) absorptions
- C≡C-H stretch:
 - 3333-3267 cm^{-1}
 - strong, narrow (as compared to OH or NH)
- C≡C-H bend:
 - 700-610 cm^{-1} : broad, strong absorption
 - 1400-1220 cm^{-1} , overtone of above