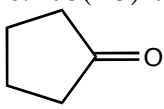


IR Interpretation Guide

Additional information for analyzing C=O stretches:

aldehyde: $\text{RC}(=\text{O})\text{H}$ 1730, $\text{R}=\text{CHC}(=\text{O})\text{H}$ 1705

unstrained ketone: $\text{RC}(=\text{O})\text{R}$ 1715, $\text{R}=\text{CHC}(=\text{O})\text{R}$ 1690

strained ketone:  1750

ester: $\text{RC}(=\text{O})\text{OR}$ 1735, $\text{R}=\text{CHC}(=\text{O})\text{OR}$ 1715.

amide: $\text{R}(\text{C}=\text{O})\text{NH}_2 < 1700$

acid: 1710 usually broad for a C=O

Additional information for analyzing C–H stretches:

If sp^3 C–H stretch at $< 3000 \text{ cm}^{-1}$ then look around 1400, sp^3 C–H bend is at 1430 and if peak at 1380 also present then sp^3 C–H is CH_3 .

If sp^2 C–H stretch at $> 3000 \text{ cm}^{-1}$, and not benzene gives rise to bending vibrations from 1000–600.

Some abbreviations for vibrational modes

ν stretching

δ in-plane bending or deformation

ρ_w wagging

ρ_r rocking

ρ_t twisting

π out-of-plane bending

Abbreviations used to further characterize vibration modes

a antisymmetric

s symmetric

d degenerate

For example, references to $\nu_s(\text{C–Cl})$ are references to the symmetrical stretching mode of a C to Cl bond.

