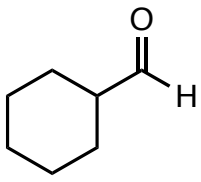
California State Polytechnic University, Pomona, Dr. Laurie S. Starkey

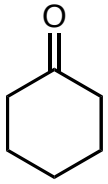
IR Correlation chart (s=strong, m=medium, v=variable)

3600–3300 (s, broad)	O–H stretch, alcohols
3400–2400 (s, broad)	O–H stretch, carboxylic acids
3500–3300 (m)	N–H stretch, amines
3300 (s)	C–H stretch, alkyne
3080–3020 (m) (just above 3000)	=C–H stretch (sp^2), alkenes, aromatic (benzene)
2960–2850 (s) (just below 3000)	C–H stretch (sp^3), alkanes
2850 and 2750 (m)	=C–H stretch, aldehydes
2260–2100 (v)	C–C triple bond stretch, alkynes
2260–2220 (v)	C–N triple bond stretch, nitriles
1750–1650 (s)	C=O stretch
1680–1620 (v)	C=C stretch, alkene
1300–1000 (s)	C–O stretch

Carbonyl Stretch: STRONG signal ~1700 cm^{-1}

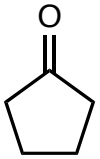


1740 cm^{-1}
aldehyde

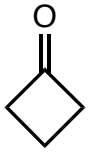


1710 cm^{-1}
ketone

ring strain increases frequency

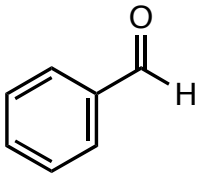


1745

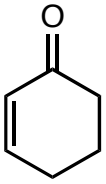


1783

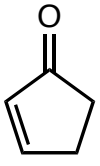
conjugation decreases frequency



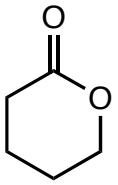
1711



1685



1710



1735 cm^{-1}
ester

Carbonyl frequencies for aldehydes and esters are typically higher than ketones.

Out-of-plane Bending Patterns (Aromatic Rings and Alkenes)