3700-3584   medium, sharr O-H stretching   alcohol   intermolecular bonded   intermolecular bonded	Absorpti	on (cn	n-1)	Appearance	Group	Compound Class	Comments
3505-3200         strong, broad medium         N-H stretching medium         alcohol medium medium         N-H stretching liphatic primary amine altiphate altiphate primary amine altiphate altiphate primary amine altiphate altiphate primary amine altiphate al	-	,	,		-	•	
3500 medium   N-H stretching   3500-3301   medium   N-H stretching   3300-3310   medium   N-H stretching   3300-3200   medium   N-H stretching   aliphatic primary amine   secondary amine   3300-2200   weak, broad   O-H stretching   amine salt   amine salt   amine salt   3333-3267   strong, sharp   C-H stretching   alkane   3400-2200   medium   C-D stretching   3400-2200   medium   C-D st				, ,			
3400-3300         medium         N-H stretching         silphatic primary amine           3300-2500         strong, broad         O-H stretching         acohody amine         usually centered on 3000 cm-1           300-2500         strong, broad         O-H stretching         alcohol         intramolecular bonded           3000-2800         strong, sharp         C-H stretching         alkene           3100-3000         medium         C-H stretching         alkene           2830-2695         medium         C-H stretching         aldehyde         doublet           2830-2695         medium         C-H stretching         aldehyde         doublet           2800-2212         weak         C-E stretching         aldehyde         doublet           2260-2190         weak         CES stretching         sirvong, broad         N-C-O stretching         sirvong divide         sisopamate           2140-2101         weak         CES stretching         alkyne         disubstituted           2140-2102         strong         N-C-S stretching         alkyne         monosubstituted           2140-1909         strong         N-C-S stretching         alkyne         monosubstituted           2140-1909         weak         C-H bending         aromatic compound			500	•	•		
3300-2500	3400-330				•	•	e
3300-2500         strong, broad         O-H stretching         carboxylic acid         usually centered on 3000 cm-1 intramolecular bonded intramolecular bonded intramolecular bonded intramolecular bonded intramolecular bonded alcohol           3300-2800         strong, sharp         C-H stretching alkyne         alkyne           3300-2840         medium         C-H stretching alkane         alkane           3830-2695         medium         C-H stretching alkane         alkane           2800-2840         medium         C-H stretching alkane         aldehyde         doublet           2800-2850         medium         C-H stretching alkane         alkane         doublet           2275-2250         strong, broad         N-C-O stretching         alkyne         disubstituted           2260-2190         weak         C2S stretching         alkyne         disubstituted           2160-2120         weak         C2C stretching         alkyne         monosubstituted           2140-1900         strong         N-C=N stretching         alkyne         monosubstituted           2140-1900         weak         C2C-S tretching         alkyne         monosubstituted           2140-1900         strong         C-C-S stretching         alkyne         monosubstituted           2181-1785         strong					•		
3200-2700         weak, broad         O-H stretching         alcohol         intramolecular bonded           3000-2800         strong, broad         N-H stretching         alkyne           3100-3000         medium         C-H stretching         alkyne           3100-3000         medium         C-H stretching         alkene           3830-2655         medium         C-H stretching         aldehyde         doublet           2600-2550         weak         S-H stretching         thiol         carbon dioxide           275-2250         strong, broad         NC-Co stretching         object stretching					•	•	usually centered on 3000 cm-1
3000-2800         strong, broad         N-H stretching         alkyne           3133-3267         strong, sharp         C-H stretching         alkene           3100-3000         medium         C-H stretching         alkene           3800-2840         medium         C-H stretching         alkene           2830-2695         medium         C-H stretching         dielehyde         doublet           2600-2550         weak         S-H stretching         thiol         responsible         doublet           2600-2520         weak         S-H stretching         carbon dioxide         strong         responsible         strong         nitrile           2260-2219         weak         CEC stretching         alkyne         disubstituted           2175-2140         strong         N-C=N stretching         azide         ketene           2140-2100         strong         N-C=N stretching         alkyne         monosubstituted           2140-1909         strong         N-C=S stretching         allene         wetane         responsible           2140-1909         medium         C=C-S stretching         allene         responsible         responsible           2140-1909         medium         C=C stretching         responsible				•	•	•	
3333-3267         strong, sharp         C-H stretching         alkene           3100-3000         medium         C-H stretching         alkene           3000-2840         medium         C-H stretching         aldehyde         doublet           2830-2695         medium         C-H stretching         thiol           2600-2550         weak         S-H stretching         carbon dioxide           2775-2250         strong, broad         N=C=O stretching         carbon dioxide           2760-2190         weak         CEX stretching         alkyne         disubstituted           2175-2140         strong         S-CEN stretching         azide         disubstituted           2175-2140         strong         N=N=N stretching         azide         disubstituted           2160-2120         strong         N=C=N stretching         azide         monosubstituted           2140-2100         weak         CEC stretching         alkyne         monosubstituted           2140-1990         strong         N=C=S stretching         alkyne         monosubstituted           2140-1900         weak         C-H bending         arbonidie         weat           1815-1785         strong         C=O stretching         conjugated acid halide				ŕ	•		
3100-3000				•	•		
3000-2840         medium         C-H stretching medium         alkane           2830-2695         weak         S-H stretching medium         thiol           2600-2500         weak         S-H stretching or C-C-O stretching         thiol           2275-2250         strong, broad         N-C-O stretching         isocyanate           2260-2220         weak         CEX stretching         alkyne         disubstituted           2175-2140         strong         N-N-N stretching         alkyne         disubstituted           2140-2120         strong         N-C-N stretching         ketene				•	•	•	
2830-2695 2600-2550 weak 2600-2550 weak weak 2349 strong 2500-250 weak 2540-2222 weak 2550-2220 weak 2560-2222 weak 2560-2222 weak 2560-2190 weak 2570-2100 					· ·		
2600-2550         weak         S-H stretching         thiol           2275-2250         strong, broad         N=C=O stretching         isocyanate           2260-2222         weak         CEN stretching         intrile           2260-2190         weak         CEC stretching         alkyne         disubstituted           2160-2100         strong         N=N-N stretching         azide           2160-2120         strong         N=C=N stretching         ketene           2145-2120         strong         N=C=N stretching         alkyne         monosubstituted           2140-2100         weak         CEC stretching         alkyne         monosubstituted           2140-1909         strong         N=C=S stretching         alkyne         monosubstituted           2140-2100         weak         CEC stretching         alkyne         monosubstituted           2140-1909         strong         N=C=S stretching         alkyne         monosubstituted           2140-1900         weak         C-H bending         aromatic compound         overtone           21815-1785         strong         C=O stretching         acid halide           1815-1785         strong         C=O stretching         conjugated acid halide					•		doublet
2275-2250         strong, broad strong, broad N=C=O stretching strong. Proceed strong strong, broad strong strong section. Proceeding strong strong section. Proceeding strong strong section. Proceeding strong strong section. Proceeding strong strong strong strong strong section. Proceeding strong strong strong section. Proceeding section.					· ·	•	
2275-2250         strong, broad         N=C=O stretching         isiocyanate           2260-2222         weak         CEN stretching         nitrile           2260-2190         weak         CEC stretching         alkyne         disubstituted           2175-2140         strong         N=N=N stretching         azide         ketene			349		•		
2260-2222         weak         CEN stretching         alkyne         disubstituted           2260-2190         weak         CEC stretching         alkyne         disubstituted           2175-2140         strong         S-CEN stretching         thiocyanate           2160-2120         strong         N=N=N stretching         azide           2145-2120         strong         N=C=N stretching         alkyne         monosubstituted           2140-2100         weak         CEC stretching         alkyne         monosubstituted           2140-1990         strong         N=C=S stretching         alkyne         monosubstituted           2000-1900         medium         C=C=C stretching         alkne         monosubstituted           2000-1650         weak         C-H bending         aromatic compound         overtone           1818 strong         C=O stretching         anhydride         anhydride           1815-1785         strong         C=O stretching         conjugated acid halide           1800-1770         strong         C=O stretching         conjugated anhydride           1770-1780         strong         C=O stretching         carboxylic acid         monomer           1750-1735         strong         C=O stretching	2275-225			•	•		
2260-2190weakCEC stretching S-CEN stretching 175-2140alkyne strong strong 2150disubstituted strong N=N=N stretching 2150alkyne carbodimide carbodimide alkene2145-2120strong 2140-2100N=C=N stretching weakcarbodimide alkynemonosubstituted2140-1990 2140-1990 2000strong medium C=C=C stretching 2000- C=C=N stretching 1818 strongN=C=N stretching N=C=S stretching alkenealkynemonosubstituted2000-1650 1818 strong 1800-1770 1775 strong 1775 strongC=O stretching C=O stretching C=O stretchingaromatic compound aromatic compound anhydride acid halideovertone1770-1780 1770-1780 1750 strong 1750-1735 1750-1735 1750 strongC=O stretching C=O stretching C=O stretching C=O stretchingcarboxylic acid seters onjugated anhydride carboxylic acid winyl / phenyl estermonomer1750-1735 1750-1735 1750 strong 1750-1735 1750 strong 1750-1735 1750 strong 1750-1735 1750 strong 1750 strong <td></td> <td></td> <td></td> <td>•</td> <td>•</td> <td>•</td> <td></td>				•	•	•	
2175-2140strongS-CEN stretching N=N=N stretching C=C=O stretching 2145-2120thiocyanate 					•		disubstituted
2160-2120         strong         N=N=N stretching         azide           2145-2120         strong         N=C=N stretching         carbodiimide           2140-2100         weak         CΞC stretching         alkyne         monosubstituted           2140-1990         strong         N=C=S stretching         isothiocyanate         allene           2000-1900         medium         C=C=C stretching         allene           2000-1650         weak         C-H bending         aromatic compound         overtone           1818 strong         C=O stretching         acid halide           1800-1770         strong         C=O stretching         conjugated acid halide           1800-1770         strong         C=O stretching         conjugated anhydride           1770-1780         strong         C=O stretching         conjugated anhydride           1750-1735         strong         C=O stretching         carboxylic acid         monomer           1750-1735         strong         C=O stretching         cyclopentanone           1745 strong         C=O stretching         cyclopentanone           1740-1720         strong         C=O stretching         cyclopentanone           1745-1705         strong         C=O stretching         cycl					_	•	
2150   C=C=O stretching   ketene				· ·	_	•	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			150	$\mathcal{E}$	•	ketene	
2140-2100weakCΞC stretching N=C=S stretching atrongalkyne isothiocyanatemonosubstituted2140-1990strong mediumC=C=S stretching C=C=S stretching atrongallene2000-1650weak 1818 strongC=H bending C=O stretching anhydrideovertone1815-1785strong 1775 strongC=O stretching C=O stretchingacid halide conjugated acid halide1770-1780strong 1760 strongC=O stretching C=O stretchingconjugated anhydride1750-1735strong 1740 strongC=O stretching C=O stretchingmonomer1750-1735strong 1745 strongC=O stretching C=O stretchingseters O-lactone6-membered lactone1740-1720strong 1745 strongC=O stretching C=O stretching $\alpha_i\beta$ -lactone y: 1770y: 17701730-1715strong C=O stretching $\alpha_i\beta$ -unsaturated ester aliphatic ketoneor formates1725-1705strong C=O stretching $\alpha_i\beta$ -unsaturated ester or or jugated acid dimeror cyclohexanone or cyclopentenone1710-1680 1710-1680 1790-1640 1690-1640 1690 strong 1690 strong 1690 strong C=O stretching C=O stretching C=O stretching C=O stretching conjugated aldehyde conjugated aldehyde conjugated ketonefree (associated: 1650)1685-1666 1680 strong 1680 strong C=O stretching C=O stretching C=O stretching C=O stretching C=O stretching C=O stretching C=O stretching conjugated ketonefree (associated: 1640) free (associated: 1630)	2145-212	20		strong	•	carbodiimide	
2140-1990strong mediumN=C=S stretching C=C=C stretching C=C=N stretchingisothiocyanate allene2000-1650weak 1818 strong 1815-1785C-H bending C=O stretching C=O stretchingaromatic compound anhydrideovertone1815-1785strong 1770C-O stretching Strongacid halide conjugated acid halide1770-1780strong 1760 strongC=O stretching C=O stretchingconjugated anhydride1750-1735strong 1750-1735C=O stretching strongcarboxylic acid carboxylic acid setersmonomer1740-1720strong 1745 strongC=O stretching C=O stretchingcyclopentanone1740-1720strong 1730-1715C=O stretching strongcyclopentanone1725-1705strong 1720-1706C=O stretching strongaldehyde C=O stretching carboxylic acid aliphatic ketone conjugated acid conjugated acid dimeror formates or cyclohexanone or cyclopentenone1710-1680 1710-1680 1710-1680 1700-1680 <td>2140-210</td> <td>00</td> <td></td> <td>· ·</td> <td>•</td> <td>alkyne</td> <td>monosubstituted</td>	2140-210	00		· ·	•	alkyne	monosubstituted
2000-1650C=C=N stretching weakC-H bending aromatic compound anhydrideovertone1815-1785strong 	2140-199	90		strong	•	•	
2000-1650weakC-H bending C=O stretchingaromatic compound anhydrideovertone1815-1785strongC=O stretching C=O stretchingacid halide1800-1770strongC=O stretching C=O stretchingconjugated acid halide1770-1780strongC=O stretching C=O stretchingconjugated anhydride1770-1780strongC=O stretching C=O stretchingcarboxylic acid C=O stretchingmonomer1750-1735strongC=O stretching C=O stretchingcarboxylic acid O-lactonemonomer1740-1720strongC=O stretching C=O stretchingcyclopentanone1740-1720strongC=O stretching C=O stretchingaldehyde1725-1705strongC=O stretching C=O stretchingaliphatic ketone carboxylic acid dimeror cyclohexanone or cyclopentenone1720-1706strongC=O stretching C=O stretchingconjugated acid conjugated acid dimerdimer1710-1680strongC=O stretching C=O stretchingconjugated aldehyde1690-1640medium mediumC=N stretching C=O stretchingprimary amide imine / oxime1685-1666strong StrongC=O stretching C=O stretchingfree (associated: 1640) free (associated: 1640) free (associated: 1630)	2000-190	00		medium	C=C=C stretching	allene	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		20	000		C=C=N stretching	ketenimine	
1815-1785strongC=O stretchingacid halide1800-1770strongC=O stretchingconjugated acid halide1770-1780strongC=O stretchingvinyl / phenyl ester1760 strongC=O stretchingcarboxylic acidmonomer1750-1735strongC=O stretchingesters6-membered lactone1750-1735strongC=O stretchingcyclopentanone1740-1720strongC=O stretchingcyclopentanone1730-1715strongC=O stretchingaldehyde1725-1705strongC=O stretchingaliphatic ketoneor cyclohexanone or cyclopentenone1720-1706strongC=O stretchingcarboxylic aciddimer1710-1680strongC=O stretchingconjugated aciddimer1710-1685strongC=O stretchingconjugated aldehyde1690-1640mediumC=N stretchingprimary amidefree (associated: 1650)1685-1666strongC=O stretchingconjugated ketone1680 strongC=O stretchingconjugated ketone1680 strongC=O stretchingconjugated ketone1680 strongC=O stretchingsecondary amidefree (associated: 1640)1680 strongC=O stretchingtertiary amidefree (associated: 1630)	2000-165	50		weak	C-H bending	aromatic compound	overtone
1800-1770   strong   C=O stretching   conjugated acid halide   1775 strong   C=O stretching   conjugated anhydride   1770-1780   strong   C=O stretching   vinyl / phenyl ester   1760 strong   C=O stretching   carboxylic acid   monomer   1750-1735   strong   C=O stretching   esters   6-membered lactone   7:1770   1745 strong   C=O stretching   cyclopentanone   1740-1720   strong   C=O stretching   aldehyde   1730-1715   strong   C=O stretching   aliphatic ketone   or cyclohexanone or cyclopentanone   1725-1705   strong   C=O stretching   carboxylic acid   dimer   1710-1680   strong   C=O stretching   carboxylic acid   dimer   1710-1685   strong   C=O stretching   conjugated acid   dimer   1710-1685   strong   C=O stretching   conjugated aldehyde   1690 strong   C=O stretching   primary amide   free (associated: 1650)   1680 strong   C=O stretching   conjugated ketone   1680 strong   C=O stretching   secondary amide   free (associated: 1640)   free (associated: 1630)   free (associated: 1630)		18	818	strong	C=O stretching	anhydride	
1770-1780 strong C=O stretching conjugated anhydride vinyl / phenyl ester 1760 strong C=O stretching carboxylic acid monomer 6-membered lactone 7: 1750-1735 strong C=O stretching esters 6-membered lactone 7: 1770	1815-178	85		strong	C=O stretching	acid halide	
1770-1780strongC=O stretchingvinyl/phenyl ester1760 strongC=O stretchingcarboxylic acidmonomer1750-1735strongC=O stretchingesters6-membered lactone1750-1735strongC=O stretchingδ-lactoneγ: 17701745 strongC=O stretchingcyclopentanone1740-1720strongC=O stretchingaldehyde1730-1715strongC=O stretchingaliphatic ketoneor formates1725-1705strongC=O stretchingaliphatic ketoneor cyclohexanone or cyclopentenone1720-1706strongC=O stretchingcarboxylic aciddimer1710-1680strongC=O stretchingconjugated aciddimer1710-1685strongC=O stretchingprimary amidefree (associated: 1650)1690-1640mediumC=N stretchingimine / oxime1685-1666strongC=O stretchingconjugated ketone1680 strongC=O stretchingconjugated ketone1680 strongC=O stretchingsecondary amidefree (associated: 1640)1680 strongC=O stretchingtertiary amidefree (associated: 1630)	1800-177	70		strong	C=O stretching	conjugated acid halide	
1750-1735 strong C=O stretching esters 6-membered lactone 1750-1735 strong C=O stretching esters 7: 1770 1745 strong C=O stretching cyclopentanone 1740-1720 strong C=O stretching aldehyde 1730-1715 strong C=O stretching aliphatic ketone or cyclopentanone or cyclopentanone 1725-1705 strong C=O stretching aliphatic ketone or cyclopentanone or cyclopentenone 1710-1680 strong C=O stretching carboxylic acid dimer 1710-1685 strong C=O stretching conjugated acid dimer 1710-1680 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)		1'	775	strong	C=O stretching	conjugated anhydride	
1750-1735 strong C=O stretching esters 6-membered lactone 1750-1735 strong C=O stretching δ-lactone γ: 1770 1745 strong C=O stretching cyclopentanone 1740-1720 strong C=O stretching aldehyde 1730-1715 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1725-1705 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1720-1706 strong C=O stretching carboxylic acid dimer 1710-1680 strong C=O stretching conjugated acid dimer 1710-1685 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1690-1640 medium C=N stretching conjugated ketone 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching free (associated: 1640) 1680 strong C=O stretching free (associated: 1630)	1770-178	80		strong	C=O stretching	vinyl / phenyl ester	
1750-1735 strong C=O stretching cyclopentanone 1740-1720 strong C=O stretching aldehyde 1730-1715 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1725-1705 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1720-1706 strong C=O stretching carboxylic acid dimer 1710-1680 strong C=O stretching conjugated acid dimer 1710-1685 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1690-1640 medium C=N stretching imine / oxime 1685-1666 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)		1'	760	strong	C=O stretching	carboxylic acid	monomer
1740-1720 strong C=O stretching aldehyde 1730-1715 strong C=O stretching aliphatic ketone or cyclopentanone or cyclopentenone 1725-1705 strong C=O stretching aliphatic ketone or cyclopentenone 1720-1706 strong C=O stretching carboxylic acid dimer 1710-1680 strong C=O stretching conjugated acid dimer 1710-1685 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1690-1640 medium C=N stretching imine / oxime 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching free (associated: 1640) 1680 strong C=O stretching free (associated: 1630)	1750-173	35		strong	C=O stretching	esters	6-membered lactone
1740-1720 strong C=O stretching aldehyde 1730-1715 strong C=O stretching α,β-unsaturated ester or formates 1725-1705 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1720-1706 strong C=O stretching carboxylic acid dimer 1710-1680 strong C=O stretching conjugated acid dimer 1710-1685 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1690-1640 medium C=N stretching imine / oxime 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)	1750-173			•	U		γ: 1770
1730-1715 strong C=O stretching α,β-unsaturated ester or formates 1725-1705 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1720-1706 strong C=O stretching carboxylic acid dimer 1710-1680 strong C=O stretching conjugated acid dimer 1710-1685 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1690-1640 medium C=N stretching imine / oxime 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)		1'	745	strong	•	• •	
1725-1705 strong C=O stretching aliphatic ketone or cyclohexanone or cyclopentenone 1720-1706 strong C=O stretching carboxylic acid dimer 1710-1680 strong C=O stretching conjugated acid dimer 1710-1685 strong C=O stretching conjugated aldehyde 1690 strong C=O stretching primary amide free (associated: 1650) 1690-1640 medium C=N stretching imine / oxime 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching secondary amide free (associated: 1640) free (associated: 1630)				strong	•	•	
1720-1706 strong C=O stretching carboxylic acid dimer  1710-1680 strong C=O stretching conjugated acid dimer  1710-1685 strong C=O stretching conjugated aldehyde  1690 strong C=O stretching primary amide free (associated: 1650)  1690-1640 medium C=N stretching imine / oxime  1685-1666 strong C=O stretching conjugated ketone  1680 strong C=O stretching secondary amide free (associated: 1640)  1680 strong C=O stretching tertiary amide free (associated: 1630)	1730-17	15		strong	· ·	•	or formates
1710-1680 strong C=O stretching conjugated acid dimer  1710-1685 strong C=O stretching conjugated aldehyde  1690 strong C=O stretching primary amide free (associated: 1650)  1690-1640 medium C=N stretching imine / oxime  1685-1666 strong C=O stretching conjugated ketone  1680 strong C=O stretching secondary amide free (associated: 1640)  1680 strong C=O stretching tertiary amide free (associated: 1630)				strong	•	-	• • •
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1690-1640 medium C=N stretching imine / oxime 1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)	1710-168			•	_		
1685-1666 strong C=O stretching conjugated ketone 1680 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)			690	•	_	•	free (associated: 1650)
1680 strong C=O stretching secondary amide free (associated: 1640) 1680 strong C=O stretching tertiary amide free (associated: 1630)					•		
1680 strong C=O stretching tertiary amide free (associated: 1630)	1685-166			•	_		
				•	_	<u> </u>	
1650 strong C=O stretching δ-lactam				•	•		tree (associated: 1630)
		10	550	strong	C=O stretching	δ-lactam	

1550 1500			1 .	
1750-1700	strong	C=O stretching	γ-lactam	
1760-1730	strong	C=O stretching	β-lactam	
1678-1668	weak	C=C stretching	alkene	disubstituted (trans)
1675-1665	weak	C=C stretching	alkene	trisubstituted
1675-1665	weak	C=C stretching	alkene	tetrasubstituted
1662-1626	medium	C=C stretching	alkene	disubstituted (cis)
1658-1648	medium	C=C stretching	alkene	vinylidene
1650-1600	medium	C=C stretching	conjugated alkene	
1650-1580	medium	N-H bending	amine	
1650-1566	medium	C=C stretching	cyclic alkene	
1648-1638	strong	C=C stretching	alkene	monosubstituted
1620-1610	strong	C=C stretching	$\alpha$ , $\beta$ -unsaturated ketone	
1550-1500	strong	N-O stretching	nitro compound	
	1465 medium	C-H bending	alkane	methylene group
	1450 medium	C-H bending	alkane	methyl group
1390-1380	medium	C-H bending	aldehyde	
1385-1380	medium	C-H bending	alkane	gem dimethyl
1440-1395	medium	O-H bending	carboxylic acid	
1420-1330	medium	O-H bending	alcohol	
1415-1380	strong	S=O stretching	sulfate	
1410-1380	strong	S=O stretching	sulfonyl chloride	
1400-1000	strong	C-F stretching	fluoro compound	
1390-1310	medium	O-H bending	phenol	
1372-1335	strong	S=O stretching	sulfonate	
1370-1335	strong	S=O stretching	sulfonamide	
1350-1342	strong	S=O stretching	sulfonic acid	anhydrous
1350-1300	strong	S=O stretching	sulfone	uning ar o as
1342-1266	strong	C-N stretching	aromatic amine	
1310-1250	strong	C-O stretching	aromatic ester	
1275-1200	strong	C-O stretching	alkyl aryl ether	
1250-1020	medium	C-N stretching	amine	
1225-1200	strong	C-O stretching	vinyl ether	
1210-1163	strong	C-O stretching	ester	
1205-1124	strong	C-O stretching	tertiary alcohol	
1150-1085	strong	C-O stretching	aliphatic ether	
1124-1087	strong	C-O stretching	secondary alcohol	
1085-1050	strong	C-O stretching	primary alcohol	
1070-1030	· ·	S=O stretching	sulfoxide	
1050-1040	strong strong, broad	CO-O-CO stretching		
995-985	•	C=C bending	alkene	monosubstituted
980-960	strong	· ·	alkene	
	strong	C=C bending		disubstituted (trans)
895-885	strong	C=C bending	alkene	vinylidene
850-550	strong	C-Cl stretching	halo compound	tui anhatituta d
840-790	medium	C=C bending	alkene	trisubstituted
730-665	strong	C=C bending	alkene	disubstituted (cis)
690-515	strong	C-Br stretching	halo compound	
600-500	strong	C-I stretching	halo compound	
$880 \pm 20$	strong	C-H bending	1,2,4-trisubstituted	

$880 \pm 20$	strong	C-H bending	1,3-disubstituted
$810 \pm 20$	strong	C-H bending	1,4-disubstituted or
$780 \pm 20$	strong	C-H bending	1,2,3-trisubstituted
$755 \pm 20$	strong	C-H bending	1,2-disubstituted
$750\pm20$	strong	C-H bending	monosubstituted

