INFRARED CORRELATION CHART

To be used in conjunction with Pavia, Lampman, and Kriz
Appendix 3, pp. 699-712

TYPE OF VIBRATION	WAVE NUMBER (CM^{-1})	INTENSITY
C-H stretch		
alkane	3000-2850	s
alkene	3100-3000	s
alkyne	3300	s
aldehyde	2900-2800	w
	2800-2700	w
aromatic	3150-3050	s
C-H bend		
alkane: -CH	1340	w
-CH2	1465	m
-CH3	1450 and 1375	m
alkene: -CH oop	1000-650	m
aromatic: -CH oop		
no sub.	670	s
mono sub.	770-730, 710-690	s
o sub.	770-735	s
m sub.	900-860, 810-750, 725-680	m, s, m
p sub.	860-800	s
1,2,4,5 sub.	900-860	m
C=C stretch		
alkene	1680-1600	m-w
aromatic	1600 (2 peaks)	w
	1500-1400 (2 peaks)	m
C ≡ C stretch	2250-2100	w
C-O stretch		
phenol	1230	s
alcohol 1^{o}	1050	s
2^{o}	1100	s
3^{o}	1150	s
ether: -aliphatic	1060-1150	s (broad)
-aromatic	1270-1230	
carboxylic acid	1250	s
ester	1300-1000 (2 peaks)	s
anhydride	1300-900	s

TYPE OF VIBRATION	WAVE NUMBER (CM^{-1})	INTENSITY
O-H stretch		
alcohol & phenol:		
free	3650-3600	s
H-bonded	3400-3200	s (broad)
carboxylic acid	3300-2500	s(v.broad)
O-H bend oop		
carboxylic acid	950-900	m(broad)
alcohol	750-650	m (broad)
C=O stretch		
aldehyde	1740-1720	vs
ketone	1725-1705	vs
carboxylic acid	1725-1700	vs
ester	1750-1730	vs
acid chloride	1810-1750	vs
amide	1700-1640	vs
anhydride	1810 and 1760	vs
C-Cl stretch	800-600	s
overtone	1500-1470	m
C-Br stretch	600-500	s
overtone	1200	m
C-I stretch	500	s
overtone	1150	m
N-H stretch		
amide, unsub.	3500-3100 (2 peaks)	m (sharp)
monosub.	3500-3100 (1 peak)	m (sharp)
amine, 1^{o}	3500-3300 (2 peaks)	m (sharp)
2^{o}	3500-3300 (1 peak)	m (sharp)
N-H bend		
amine	1640-1560	m (broad)
amide	1640-1550	m (broad)
C-N stretch		
amine: -aliphatic	1220-1020	m
-aromatic	1350-1250	s

CES rev 10/96