

## Handout for Chem 2320

Bonding	Frequencies (cm <sup>-1</sup> )	Note
C≡N	2260-2200	M
C≡C	2260-2100	M, W
C=C	1660	M
C=N	1650-1550	M
O=C=O	2350	S (broad)
C=O (acid halide)	1800	S (broad, F>Cl>Br>I)
C=O (anhydride)	1775, 1750	S (broad)
C=O (ester)	1750	S (broad)
C=O (aldehyde)	1725	S (broad)
C=O (ketone)	1700	S (broad)
C=O (acid)	1700	S (broad)
C=O (amide)	1675	S (broad)
C-O	1250-1050	S (broad)
C-N	1250-1050	M
O-H	3600-3200	S (very broad)
N-H	3500-3300	M (very broad)
NH <sub>2</sub>	3500-3300	M (very broad, two peaks)
C(sp <sup>3</sup> )-H	<3000	M
C(sp <sup>2</sup> )-H	>3000	M
C(sp)-H	3300	M
C(sp <sup>2</sup> , aldehyde)-H	2850, 2750	M
H-C=C-H (trans)	980-960	M
H-C=C-H (cis)	700	M
Aromatic, mono-sub	690	M
Aromatic, ortho-sub	690, 750	M
Aromatic, meta-sub	690, 750, 800-840	M
Aromatic, para-sub	800-840	M

S: strong; M: medium; W: weak