

Simplified Table of Main IR Frequencies

Wave number, cm^{-1}	Functional Group	Peak Description
3300 – 3600	O-H (alcohol)	Strong and broad
2500 – 3000 can reach	O-H (carboxylic acids)	Very broad (over $\sim 500 \text{ cm}^{-1}$), often looks like distorted baseline, above 3000 cm^{-1} .
3200 – 3500	N-H	Doublet in case of NH_2 group of a primary amine or amide
3300	$\text{C}\equiv\text{C}-\text{H}$ terminal alkyne	Usually sharp and strong
3000 - 3100	$\text{C}=\text{C}-\text{H}$ alkene or arene	Often weak, overlaps with CH alkane absorption
2800 – 3000	C-H (sp^3 carbon)	Strong, broad and multi-banded
2250 - 2220	$\text{C}\equiv\text{N}$	Medium intensity
2100 - 2260	$\text{C}\equiv\text{C}$ alkyne	Medium intensity for terminal alkynes, very weak for internal
1680 – 1820	C=O (amides, ketones, aldehydes carboxylic acid, esters)	Very strong; lower frequency for amides and when C=O is conjugated
1600 – 1650	C=C alkene, aromatic ring	Check to see if you have C-H unsaturated $>3000 \text{ cm}^{-1}$ (if not, it's completely substituted)
~ 1600	$-\text{NH}_2$ (bending) 1° amines and amides	Only if you have corresponding N-H peak at $3200\text{-}3500 \text{ cm}^{-1}$ (this peak may be mistaken for C=C otherwise)
1200	Ar-O	Strong (look for =C-H & C=C first)
1050-1150	C-O	
690 and 750	phenyl group	Strong (look for =C-H & C=C first)