









These notes can be obtained at: <http://www.ndsu.nodak.edu/instruct/grcook/chem342/notes.shtml>

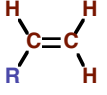
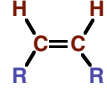
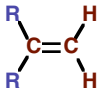
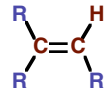
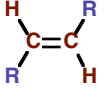
Chapter 12: Mass Spectrometry and Infrared Spectroscopy

Infrared Spectroscopy

Vibrational frequency ranges of various Functional Groups

| Functional Group | Wavenumber Range (cm ⁻¹) | Absorption Strength | notes | | | |
|---|--------------------------------------|---------------------|---------------|-----------|--------|--|
|  | 2850-2960 | medium-strong | below 3000 | | | |
|  | 3020-3100 | medium | above 3000 | | | |
|  | 3300 | strong | above 3000 | | | |
| O-H | 3400-3650 | broad-strong | | | | |
| N-H | 3300-3500 | medium | #H's = #peaks | | | |
|    | 2100-2260 | medium | | | | |
|  | | | | 1680-1750 | strong | |
|  | | | | 1640-1750 | medium | |
| C-C | 800-1300 | medium | | | | |
| C-O | 1050-1150 | medium | | | | |
| C-X | <1000 | strong | | | | |

Alkene out of plane bending

| | | | | | |
|---|-------------|--------|---|-----|--------|
|  | 910 and 990 | strong |  | 700 | strong |
|  | 890 | strong |  | 815 | strong |
|  | 970 | strong | | | |