

Selected ^1H NMR Correlations

structural type	chemical shift range (ppm)
$\text{H}_2\text{C} \triangle$ $\text{HC} \triangle$ $\quad \quad \quad $	0.0–0.9
$\begin{array}{c} \\ -\text{C}\text{NH}_2 \\ \end{array}$ $\begin{array}{c} \\ (-\text{C})_2\text{NH} \\ \end{array}$	0.5–5.0 ^a
$-\text{CH}_3$ (alkyl)	0.7–1.3
$\text{H}_3\text{C}-\begin{array}{c} \\ \text{C} \\ \end{array}-\begin{array}{c} \\ \text{C} \\ \end{array}-\text{X}$ (X = halogen, O, N, carbonyl)	0.9–1.2
$-\text{CH}_2$ (alkyl)	1.2–1.3
$-\text{CH}$ (alkyl)	1.4–2.0
$\text{H}_3\text{C}-\begin{array}{c} \\ \text{C} \\ \end{array}-\text{X}$ (X = halogen, O, N, carbonyl)	1.0–2.0
$-\text{COH}$	0.5–5.0 ^a
$\text{H}_3\text{C}-\text{C}=\text{C}$ $\quad \quad \quad \diagup \quad \diagdown$	1.6–1.9
$\text{H}_3\text{C}-\text{C}\equiv\text{C}-$	1.8–2.2
$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-$ $\quad \quad \quad \diagdown$	1.9–2.6
$\text{H}_3\text{C}-\text{Ar}$ (Ar = aromatic ring)	2.0–2.6
$\text{H}_3\text{C}-\text{N}$ $\quad \quad \quad \diagup \quad \diagdown$	2.0–3.0
$-\text{C}\equiv\text{C}-\text{H}$ (nonconjugated)	2.0–2.6
$-\text{C}\equiv\text{C}-\text{H}$ (conjugated)	2.8–3.1

structural type	chemical shift range (ppm)
$\text{H}_3\text{C-X}$ (X = halogen)	2.0–4.5
$\text{H}_3\text{C-S-}$	2.2–2.8
$\text{H}_3\text{C-O-}$	3.5–4.3
ArNH_2 Ar_2NH	3.0–5.0 ^a
ArOH	4.0–10.0 ^a
$\text{H}_2\text{C}=\text{C}'$ (nonconjugated)	4.6–5.0
$\begin{array}{c} \text{H} \\ \diagdown \\ \text{C}=\text{C}' \\ \diagup \end{array}$ (nonconjugated)	5.1–5.9
$\text{H}_2\text{C}=\text{C}'$ (conjugated)	5.3–6.3
$\begin{array}{c} \text{H} \\ \diagdown \\ \text{C}=\text{C}' \\ \diagup \end{array}$ (conjugated)	5.3–7.7
$\begin{array}{c} \text{O} \\ \parallel \\ \text{---C---NH}_2 \end{array}$ $\begin{array}{c} \text{O} \\ \parallel \\ \text{---C---N---} \\ \\ \text{H} \end{array}$	5.5–8.5
ArH	6.0–9.5
$\begin{array}{c} \text{O} \\ \parallel \\ \text{H---C---N---} \\ \\ \text{I} \end{array}$	7.8–8.2
$\begin{array}{c} \text{O} \\ \parallel \\ \text{H---C---O---} \end{array}$	8.0–8.4
$\begin{array}{c} \text{O} \\ \parallel \\ \text{---C---H} \end{array}$ $\begin{array}{c} \text{O} \\ \parallel \\ \text{Ar---C---H} \end{array}$	9.5–10.5
$\begin{array}{c} \text{O} \\ \parallel \\ \text{---C---OH} \end{array}$ $\begin{array}{c} \text{O} \\ \parallel \\ \text{Ar---C---OH} \end{array}$	9.7–13.2

^a Highly dependent upon concentration and solvent effects.