

Table 13.3 Correlation of ^1H Chemical Shift with Environment

Type of hydrogen	Chemical shift (δ)	Type of hydrogen	Chemical shift (δ)
Reference $\text{Si}(\text{CH}_3)_4$	0	Alcohol ---C---O---H	2.5–5.0
Alkyl (primary) ---CH_3	0.7–1.3		
Alkyl (secondary) $\text{---CH}_2\text{---}$	1.2–1.6		
Alkyl (tertiary) $\begin{array}{c} \\ \text{---CH---} \end{array}$	1.4–1.8	Alcohol, ether $\begin{array}{c} \text{H} \\ \\ \text{---C---O---} \end{array}$	3.3–4.5
Allylic $\begin{array}{c} \text{H} \\ \\ \text{C}=\text{C---C---} \\ \\ \text{O} \end{array}$	1.6–2.2	Vinylic $\begin{array}{c} \text{H} \\ \diagup \quad \diagdown \\ \text{C}=\text{C} \end{array}$	4.5–6.5
Methyl ketone $\text{---C}(=\text{O})\text{---CH}_3$	2.0–2.4		
Aromatic methyl Ar---CH_3	2.4–2.7	Aryl Ar---H	6.5–8.0
Alkynyl $\text{---C}\equiv\text{C---H}$	2.5–3.0	Aldehyde $\text{---C}(=\text{O})\text{---H}$	9.7–10.0
Alkyl halide $\begin{array}{c} \text{H} \\ \\ \text{---C---Hal} \end{array}$	2.5–4.0	Carboxylic acid $\text{---C}(=\text{O})\text{---O---H}$	11.0–12.0