TABLE 16.2 CHEMICAL SHIFTS FOR PROTONS IN DIFFERENT ELECTRONIC ENVIRONMENTS

TYPE OF PROTON	CHEMICAL SHIFT (δ)	TYPE OF PROTON	CHEMICAL SHIFT (δ)
Methyl R—CH_3	~0.9	Alkyl halide R—C(H)(R)—X	2–4
Methylene CH_2	~1.2	Alcohol R—O—H	2–5
Methine CH	~1.7	Vinylic C=C(H)	4.5–6.5
Allylic C=C—C(H)	~2	Aryl	6.5–8
Alkynyl R—C≡C—H	~2.5	Aldehyde R—C(=O)—H	~10
Aromatic methyl	~2.5	Carboxylic acid R—C(=O)—O—H	~12

TYPE OF PROTON	CHEMICAL SHIFT (δ)
Allylic C=C—C(H)	~2
Alkynyl R—C≡C—H	~2.5
Aromatic methyl	~2.5

TYPE OF PROTON	CHEMICAL SHIFT (δ)
Methyl R—CH_3	~0.9
Methylene CH_2	~1.2
Methine CH	~1.7