SOME TYPICAL ^{1}H CHEMICAL SHIFT VALUES:

1. Alkanes and alkyl groups:

C**H**$_3$ – C	δ 0.9 – 1.1 ppm
C – C**H**$_2$ – C	δ 1.3 ppm
C – C**H** – C |	δ 1.4 ppm
C**H**$_3$ – C = C	δ 1.7 ppm
C – C**H**$_2$ – C = C	δ 2.0 ppm
C**H**$_3$ – C = C	δ 1.8 ppm
C**H**$_3$ – Ph	δ 2.3 ppm
C**H**$_3$ – C = O |	δ 2.1 ppm
C – C**H**$_2$ – C = O |	δ 2.5 ppm
C**H**$_3$ – C = C	δ 1.7 ppm
C – C**H**$_2$ – C = C	δ 2.0 ppm
C**H**$_3$ – C = C	δ 1.8 ppm
C**H**$_3$ – X (X = halogen)	δ 2.5 – 4 ppm
C – C**H**$_2$ – X (X = halogen)	δ 3 – 4 ppm
C**H**$_3$ – O	δ 3 – 4 ppm
C – C**H**$_2$ – O	δ 3.5 – 4.5 ppm

2. Alkenes:

C = C – **H**	δ 4.5 – 6 ppm

3. Alkynes:

C = C – **H**	δ 2.5 ppm

4. Benzene and compounds containing benzene rings:

Ph – **H**	δ 7.15 ppm
Various benzene ring **H**-atoms	δ 7 – 8.5 ppm

5. Alcohols and Phenols:

R – O**H**	δ 2 – 5 ppm
Ar – O**H**	δ 4 – 7 ppm

6. Aldehydes:

R – C = O | H	δ 9 – 10 ppm

7. Carboxylic Acids:

R – COO**H**	δ 10 – 12 ppm

8. Amines:

R – N**H**$_2$	δ 1.5 – 4 ppm

SOME TYPICAL ^{13}C CHEMICAL SHIFT VALUES:

1. **Alkanes and alkyl groups (sp^3 hybridized C):**

C – **C** – C δ 0 – 30 ppm

C – C = C δ 20 – 40 ppm

C – C = O δ 20 – 40 ppm

C – **C** – X δ 20 – 40 ppm

(X = halogen)

C – **C** – O δ 50 – 75 ppm

2. **Alkynes (sp-hybridized C):**

C = **C** δ 75 – 95 ppm

3. **Nitriles (sp-hybridized C):**

N = **C** δ 100 – 120 ppm

4. **Alkenes (sp^2 hybridized C):**

C = **C** δ 100 – 150 ppm

5. **Benzene rings (sp^2 hybridized C):**

δ 110 – 150 ppm

6. **Carboxylic Acids and Derivatives (sp^2 hybridized C):**

-**C**OOH, -**C**OOR,

-**C**ONR$_2$, -**C**OCl δ 155 – 180 ppm

7. **Aldehydes (sp^2 hybridized C):**

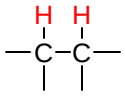
R – **C** = O δ 180 – 210 ppm
|
H

8. **Ketones (sp^2 hybridized C):**

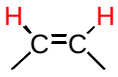
R – **C** = O δ 190 – 220 ppm
|
R’

SOME TYPICAL ^{1}H COUPLING CONSTANTS:

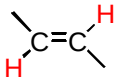
12 – 15 Hz



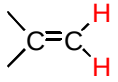
7 – 8 Hz



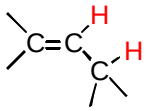
10 Hz



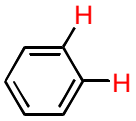
15 Hz



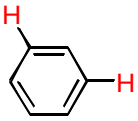
2 Hz



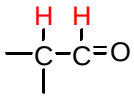
6 Hz



8 – 8.5 Hz



1 – 2 Hz



1 – 3 Hz