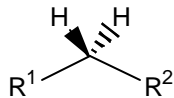


## Coupling Constants (Hz)

I. For two-bond coupling ( ${}^2J_{\text{HH}}$ ):

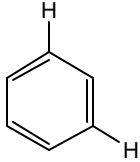
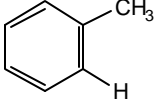
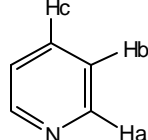
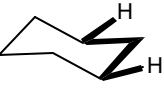

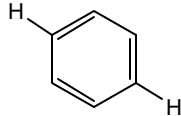
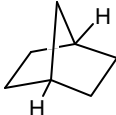


$R^1 =$	$R^2 =$	${}^2J_{\text{HH}}$ (Hz)
alkyl	alkyl	12 - 15 (typical)
	$-(\text{CH}_2)_2-$	3 - 9
	$-(\text{CH}_2)_3-$	11 - 17
	$-(\text{CH}_2)_4-$	8 - 18
	$-(\text{CH}_2)_5-$	11 - 14
H	Ph	14
alkoxyl	Ph	12
H	OH	11
	$-\text{O}(\text{CH}_2)_2\text{O}-$	0
	$-\text{O}(\text{CH}_2)_3\text{O}-$	5 - 6
		0 - 3

II. For three-bond coupling ( ${}^3J_{\text{HH}}$ ):

Types of Structures	${}^3J_{\text{HH}}$ (Hz)	
$-\text{CH}_2-\text{CH}_2-$ (free rotation)	7	
	axial-axial	8 - 10
	axial-equatorial	2 - 3
	equatorial-axial	2 - 3
	cis or trans	4 - 5
	cis or trans	8
	cis or trans	3 - 5
	cis	8 (typical)
	trans	15 (typical)
		6 - 9
	Ha - Hb	5.5
	Hb - Hc	7.6

III. For long-range (four or five-bond) coupling ( ${}^4J_{\text{HH}}$  or  ${}^5J_{\text{HH}}$ ):

Types of Structures	Coupling Constants	
	${}^4J_{\text{HH}} = 1 - 3 \text{ Hz}$	
	${}^4J_{\text{HH}} = 0 - 1 \text{ Hz}$	
	${}^4J_{\text{HH}} = 1 - 2 \text{ Hz}$ (Ha - Hc)	
	${}^4J_{\text{HH}} = 1 - 2 \text{ Hz}$	
	${}^4J_{\text{HH}} = 7 - 8 \text{ Hz}$	
	${}^5J_{\text{HH}} = 0 - 1 \text{ Hz}$	
	${}^5J_{\text{HH}} = 1 - 1.5 \text{ Hz}$	