

# Contents

<b>1</b>	<b>Steric and Stereoelectronic Control of Organic Molecular Structures and Organic Reactions</b>	<b>1</b>
1	Influence of Steric Effects on Structures	1
2	Influence of Stereoelectronic Effects on Reactions	6
3	Evaluation of the Numerical Value of Anomeric Effect	28
4	Influence of Anomeric Effect on Conformational Preferences	29
5	Influence of Anomeric Effect on Conformational Reactivities	35
6	Conformations of Mono and Dithioacetals	40
7	Conformations of Mono and Diazaacetals	43
	References	44
<b>2</b>	<b>Reactions at Saturated and Unsaturated Carbons</b>	<b>47</b>
	References	68
<b>3</b>	<b>Diastereoselectivity in Organic Reactions</b>	<b>71</b>
1	Cram's Model for Asymmetric Synthesis	72
2	Anh–Felkin Modification of Cram's Model for Asymmetric Synthesis	72
3	Cieplak's Model for Diastereoselectivity	76
4	Houk's Transition State and Electrostatic Models for Diastereoselectivity	83
5	Cation Coordination Model for Diastereoselectivity	86
	References	100
<b>4</b>	<b>A<sup>(1,2)</sup> and A<sup>(1,3)</sup> Strains</b>	<b>103</b>
1	Introduction	103
2	A <sup>(1,2)</sup> Strain	105
3	Stereocontrol in Reactions on Account of A <sup>(1,2)</sup> Strain	109
4	A <sup>(1,3)</sup> Strain	111
5	Stereocontrol in Reactions on Account of A <sup>(1,3)</sup> Strain	113

6	A <sup>(1,3)</sup> Strain in Amides and Its Consequences on Diastereoselectivity . . . . .	122
	References . . . . .	124
<b>5</b>	<b>The Conservation of Orbital Symmetry (Woodward–Hoffmann Rules) . . . . .</b>	<b>127</b>
1	Introduction . . . . .	127
2	Orbitals and Symmetry Considerations . . . . .	128
3	$\pi^2 + \pi^2$ Reaction . . . . .	131
4	Electrocyclic Ring Closure and Ring Opening Reactions . . . . .	139
5	Diels–Alder Reaction ( $\pi^4 + \pi^2$ Reaction) . . . . .	144
	References . . . . .	146
<b>6</b>	<b>The Overlap Component of the Stereoelectronic Factor</b>	
	<b>Vis-à-Vis the Conservation of Orbital Symmetry Rules . . . . .</b>	<b>147</b>
1	Introduction . . . . .	147
2	Steric Effects in the Thermal Fragmentation of <i>Cis</i> -3,6-Dimethyl-3,6-Dihydropyridazine . . . . .	149
3	Orbital Overlap Effects in the Thermal Fragmentation of Cyclopropanated and Cyclobutanated <i>Cis</i> -3,6-Dimethyl-3,6-Dihydropyridazine . . . . .	149
4	Orbital Overlap Effects in [1,5] Sigmatropic Shifts . . . . .	151
5	Difficulties Experienced with the [1,5] Sigmatropic Shift in Cyclobutanated Species . . . . .	153
	References . . . . .	155
<b>7</b>	<b>Miscellaneous . . . . .</b>	<b>157</b>
1	Spiroconjugation . . . . .	157
2	Periselectivity . . . . .	159
3	Torquoselectivity . . . . .	167
4	Ambident Nucleophiles . . . . .	169
5	Ambident Electrophiles . . . . .	172
6	$\alpha$ -Effect . . . . .	182
7	Carbenes . . . . .	184
8	Hammett Substituent Constants . . . . .	187
9	Hammond Postulate . . . . .	195
10	Curtin–Hammett Principle . . . . .	196
11	Diastereotopic, Homotopic, and Enantiotopic Substituents . . . . .	197
	References . . . . .	200
	<b>Questions . . . . .</b>	<b>203</b>

Steric and Stereoelectronic Effects in Organic  
Chemistry

Yadav, V.K.

2016, XI, 211 p. 300 illus., 83 illus. in color., Hardcover

ISBN: 978-981-10-1138-2