

Contents

1 Stereochemistry—Why?	1
1.1 Isomerism—What is it?	2
1.2 Auxiliary Means	2
1.3 How do I Construct a Molecule?	3
2 Basics	5
2.1 What is Assumed	5
2.2 Terms of Access	6
2.2.1 Isomer	6
2.2.2 Constitution and Constitutional Isomers	6
2.2.3 Conformation and Conformational Isomers	6
2.2.4 Configuration and Stereoisomers	7
2.2.5 Tautomerism	7
3 Constitutional Isomers	9
3.1 Skeletal Isomerism	9
3.1.1 <i>n</i> -, <i>iso</i> -, <i>neo</i> -	9
3.2 Positional Isomerism	10
3.2.1 <i>gem</i> -, <i>vic</i> - Isomers	10
3.2.2 α -, β -, γ -, ω - Isomers	10
3.2.3 <i>o</i> -, <i>m</i> -, <i>p</i> - Isomers	12
3.3 Functional Isomerism	12
3.4 Valence Isomerism	12
3.5 Tautomerism	13
3.5.1 Keto-enol Tautomerism	13
3.5.2 Amide-imidol Tautomerism	15

3.5.3	Oxo-enol-enon Tautomerism	15
3.5.4	Valence Tautomerism	15
4	Stereoisomerism	17
4.1	Enantiomers	17
4.1.1	Optical Activity	18
4.1.2	Racemates, Racemic Mixtures	18
4.1.3	Biological Effect	19
4.2	Diastereomers	19
4.2.1	Diastereomers and Geometric Isomerism	19
4.2.2	Diastereomers and Several Stereo Centers	20
4.2.3	Diastereomers and Enantiomers	21
5	Configuration Isomers: Geometric Isomerism	23
5.1	<i>cis</i> -/ <i>trans</i> - Isomerism in Double Bonds	23
5.2	<i>cis</i> -/ <i>trans</i> - Isomerism in Ring Systems	24
5.3	CIP Rules	25
5.4	(<i>Z</i>)-/(<i>E</i>)-Isomerism	27
5.5	Bridged Bicyclic Hydrocarbons	27
6	Configuration Isomers: Optical Isomerism	29
6.1	Chirality	29
6.2	(<i>R</i>)/(<i>S</i>) Nomenclature	30
6.2.1	(<i>l</i>)-/(<i>u</i>)-Nomenclature	30
6.3	D/L configuration, Fischer projection	31
6.3.1	Comments	32
6.3.2	Convert Fischer Projection to Wedge Formula	32
6.4	<i>Threo</i> / <i>erythro</i> Isomers	33
6.5	Axial chirality	33
6.6	Planar Chirality	34
6.7	Helical Chirality	34
7	Configuration Isomers: Sugar	37
7.1	Anomers	38
7.2	Display Variants	38
7.3	Nomenclature of Monosaccharides	38
7.4	Disaccharides	40

8 Conformation Isomers	41
8.1 Visualization possibilities	41
8.2 Ethane Conformers	42
8.3 Butane Conformers	42
8.4 Cyclohexane Conformers	44
Overviews	49
References	51