
Fascinating Molecules in Organic Chemistry

FRITZ VÖGTLE

with the collaboration of

F. Alfter, J. Böttcher, V. Hautzel, P. Knops, U. Müller, W. Jaworek,
A. Ostrowicki, K. Saitmacher, Ch. Seel, G. Sendhoff, N. Sendhoff,
L. Rossa, L. Radon, T. Papkalla, P. Windscheif, U. Wolf and E Weber

University of Bonn, Germany

Translated by

G. V. Boyd

*Department of Organic Chemistry,
Hebrew University of Jerusalem, Israel*

JOHN WILEY & SONS

Chichester · New York · Brisbane · Toronto · Singapore

Contents

Preface		vii
Chapter 1	Introduction: Fascinating Structures and Symmetry	1
	1.1 Attractive Structures in the Natural Sciences	1
	1.2 Symmetry in Art	4
	1.3 Symmetry, Dissymmetry and Violation of Parity	6
	1.4 Fascinating Structures in Chemistry	11
Chapter 2	Alicyclic Compounds	19
	2.1 Tetra- <i>t</i> -butyltetrahedrane	19
	2.2 Cubane	24
	2.3 Dodecahedranes	30
	2.4 Adamantane	44
	2.5 Pagodane	58
	2.6 [1.1.1]Propellane	64
Chapter 3	Aromatic Compounds	71
	3.1 The Triphenylcyclopropenylum Cation	71
	3.2 Azulene	84
	3.3 Biphenylene	110
	3.4 Circulenes and Cycloarenes	126
	3.5 [7]Helicene and Other Helicenes	156
Chapter 4	Aralicyclic Compounds	181
	4.1 Triptycene and Iptycenes	181
	4.2 1,8-Methanonaphthalene and Heterocyclic Analogues	200
	4.3 [2.2.2]Phanes—Triply Bridged Benzene Rings	215
	4.4 Superphane	225
Chapter 5	Heterocycles and Biologically Active Compounds	237
	5.1 Tröger's Base	237
	5.2 Acetylsalicylic Acid	250
	5.3 Vitamin B ₆ (Pyridoxine)	261
	5.4 Phthalocyanines	271
	Epilogue: New Tetrapyrrole Macrocycles	290

vi

Conclusion	294
Author Index	297
Subject Index	301