

Volume 9: Fully Unsaturated Small-Ring Heterocycles and Monocyclic Five-Membered Heterocycles with One Heteroatom

Introduction

	G. Maas	1
9.1	Product Class 1: Oxirenes	
	K.-P. Zeller	19
9.2	Product Class 2: Thiirenes and Their Derivatives	
	N. Tokitoh and W. Ando	43
9.3	Product Class 3: Selenirenes	
	N. Tokitoh and W. Ando	61
9.4	Product Class 4: Tellurirenes	
	N. Tokitoh and W. Ando	65
9.5	Product Class 5: 1H-Azirines	
	K.-P. Zeller	67
9.6	Product Class 6: Phosphirenes	
	H. Heydt	85
9.7	Product Class 7: Three-Membered Rings with Phosphorus and One or More Heteroatoms	
	H. Heydt	125
9.8	Product Class 8: Four-Membered Rings with One or More Heteroatoms	
	M. Regitz and U. Bergsträsser	135
9.9	Product Class 9: Furans	
	B. König	182
9.10	Product Class 10: Thiophenes, Thiophene 1,1-Dioxides, and Thiophene 1-Oxides	
	J. Schatz	287
9.11	Product Class 11: Selenophenes	
	J. Schatz	423
9.12	Product Class 12: Tellurophenes	
	J. Schatz	433
9.13	Product Class 13: 1H-Pyrroles	
	D. StC. Black	441
9.14	Product Class 14: Phospholes	
	F. Mathey	553

Volume 10: Fused Five-Membered Heteroarenes with One Heteroatom

Introduction

	E. J. Thomas	1
10.1	Product Class 1: Benzo[<i>b</i>]furans C. P. Dell	11
10.2	Product Class 2: Benzo[<i>d</i>]furans P. G. Steel	87
10.3	Product Class 3: Dibenzofurans K. Jones	131
10.4	Product Class 4: Benzo[<i>b</i>]thiophenes C. M. Rayner and M. A. Graham	155
10.5	Product Class 5: Benzo[<i>d</i>]thiophenes T. L. Gilchrist and S. J. Higgins	185
10.6	Product Class 6: Dibenzothiophenes M. D. Andrews	211
10.7	Product Class 7: Benzo[<i>b</i>]selenophenes P. J. Murphy	265
10.8	Product Class 8: Benzo[<i>d</i>]selenophenes P. J. Murphy	301
10.9	Product Class 9: Dibenzoselenophenes P. J. Murphy	307
10.10	Product Class 10: Benzo[<i>b</i>]tellurophenes P. J. Murphy	325
10.11	Product Class 11: Benzo[<i>d</i>]tellurophenes P. J. Murphy	343
10.12	Product Class 12: Dibenzotellurophenes P. J. Murphy	347
10.13	Product Class 13: Indole and Its Derivatives J. A. Joule	361
10.14	Product Class 14: 1<i>H</i>- and 2<i>H</i>-Isoindoles T. J. Donohoe	653
10.15	Product Class 15: Carbazoles P. T. Gallagher	693
10.16	Product Class 16: Indolizines M. Shipman	745
10.17	Product Class 17: Benzo[<i>b</i>]phospholes R. A. Aitken	789

10.18	Product Class 18: Benzo[d]phospholes	
	R. A. Aitken	809
10.19	Product Class 19: Dibenzophospholes	
	R. A. Aitken	817
10.20	Product Class 20: Phosphorus Analogues of Indolizines	
	R. A. Aitken	839

Volume 11: Five-Membered Heteroarenes with One Chalcogen and One Additional Heteroatom

Introduction

	E. Schaumann	1
11.1	Product Class 1: 1,3-Dioxolium Salts and Annulated Analogues	
	H. Perst	13
11.2	Product Class 2: 1,2-Oxatholium Salts	
	H. Perst	31
11.3	Product Class 3: 1,3-Oxatholium Salts and Related Compounds	
	H. Perst and C. Klenke	35
11.4	Product Class 4: 1,2-Oxaselenolium Salts	
	H. Perst	89
11.5	Product Class 5: 1,3-Oxaselenolium Salts	
	H. Perst	93
11.6	Product Class 6: 1,2-Oxatellurolium Compounds and Benzoannulated Analogues	
	H. Perst	97
11.7	Product Class 7: 1,2-Ditholium Salts and Related Compounds	
	C. Th. Pedersen	107
11.8	Product Class 8: 1,3-Ditholium Salts, Se and Te Analogues and Benzoannulated Analogues	
	G. Schukat and E. Fanghänel	191
11.9	Product Class 9: Isoxazoles	
	B. J. Wakefield	229
11.10	Product Class 10: 1,2-Benzisoxazoles and Related Compounds	
	R. K. Smalley	289
11.11	Product Class 11: 2,1-Benzisoxazoles and Related Compounds	
	R. K. Smalley	337
11.12	Product Class 12: Oxazoles	
	G. V. Boyd	383
11.13	Product Class 13: Benzoxazoles and Other Annulated Oxazoles	
	G. V. Boyd	481

11.14	Product Class 14: 1,3-Oxaphospholes and Benzoannulated Analogues	
	D. Gudat	493
11.15	Product Class 15: Isothiazoles	
	D. W. Brown and M. Sainsbury	507
11.16	Product Class 16: Benzisothiazoles	
	D. W. Brown and M. Sainsbury	573
11.17	Product Class 17: Thiazoles	
	D. Kikelj and U. Urleb	627
11.18	Product Class 18: Benzothiazoles and Related Compounds	
	H. Ulrich	835
11.19	Product Class 19: 1,2- and 1,3-Thiaphospholes and Benzoannulated Analogues	
	D. Gudat	913
11.20	Product Class 20: Isoselenazoles	
	W.-D. Pfeiffer	921
11.21	Product Class 21: Annulated Isoselenazole Compounds	
	W.-D. Pfeiffer	931
11.22	Product Class 22: Selenazoles	
	W.-D. Pfeiffer	941
11.23	Product Class 23: Annulated Selenazole Compounds	
	W.-D. Pfeiffer	991
11.24	Product Class 24: 1,3-Selenaphospholes	
	D. Gudat	1001
11.25	Product Class 25: Isotellurazoles, and Annulated Isotellurazole and Tellurazole Compounds	
	W.-D. Pfeiffer	1005

Volume 12: Five-Membered Heterocycles with Two Nitrogen or Phosphorus Atoms

Introduction

	R. Neier	1
12.1	Product Class 1: Pyrazoles	
	B. Stanovnik and J. Svete	15
12.2	Product Class 2: 1<i>H</i>- and 2<i>H</i>-Indazoles	
	W. Stadlbauer	227
12.3	Product Class 3: Imidazoles	
	M. R. Grimmett	325
12.4	Product Class 4: Benzimidazoles	
	M. R. Grimmett	529

12.5	Product Class 5: Azaindolizines with Two Nitrogen Atoms in the Five-Membered Ring	
	G. Hajos and Z. Riedl	613
12.6	Product Class 6: Azaphospholes and Azarsoles	
	A. Schmidpeter and K. Karaghiosoff	679
12.7	Product Class 7: Diphospholes	
	F. Mathey	705

Volume 13: Five-Membered Heteroarenes with Three or More Heteroatoms

Introduction

	R. C. Storr and T. L. Gilchrist	1
13.1	Product Class 1: 1,2,5-Oxathiazoles, 1,2,3-Dithiazoles, and Related Compounds	
	N. G. Argyropoulos	9
13.2	Product Class 2: 1,2,4-Dioxazoles, 1,2,4-Oxathiazoles, and 1,2,4-Dithiazoles	
	N. G. Argyropoulos	29
13.3	Product Class 3: 1,3,2-Oxathiazoles, 1,3,2-Dithiazoles, and Related Compounds	
	N. G. Argyropoulos	73
13.4	Product Class 4: 1,4,2-Oxathiazoles and Related Compounds	
	N. G. Argyropoulos	95
13.5	Product Class 5: 1,2,3-Oxadiazoles	
	T. L. Gilchrist	109
13.6	Product Class 6: 1,2,4-Oxadiazoles	
	K. Hemming	127
13.7	Product Class 7: 1,2,5-Oxadiazoles	
	R. M. Paton	185
13.8	Product Class 8: 1,3,4-Oxadiazoles	
	G. W. Weaver	219
13.9	Product Class 9: 1,2,3-Thiadiazoles	
	D. J. Wilkins and P. A. Bradley	253
13.10	Product Class 10: 1,2,4-Thiadiazoles	
	D. J. Wilkins and P. A. Bradley	277
13.11	Product Class 11: 1,2,5-Thiadiazoles and Related Compounds	
	P. A. Koutentis	297
13.12	Product Class 12: 1,3,4-Thiadiazoles	
	S. J. Collier	349

13.13	Product Class 13: 1,2,3-Triazoles	
	A. C. Tomé	415
13.14	Product Class 14: 1,2,4-Triazoles	
	A. D. M. Curtis	603
13.15	Product Class 15: Dithiaphospholes and Their Analogues	
	R. K. Bansal, N. Gupta, and S. J. Collier	641
13.16	Product Class 16: Oxazaphospholes and Thiazaphospholes	
	R. K. Bansal and Neelima Gupta	647
13.17	Product Class 17: Oxadiphospholes and Their Analogues	
	S. J. Collier	659
13.18	Product Class 18: Diazaphospholes and Diazarsoles	
	R. K. Bansal and Neelima Gupta	689
13.19	Product Class 19: Azadiphospholes and Their Analogues	
	S. J. Collier	717
13.20	Product Class 20: Triphospholes and Diphospharsoles	
	R. K. Bansal and Neelima Gupta	729
13.21	Product Class 21: Thiadiazaphospholes	
	S. J. Collier	739
13.22	Product Class 22: Triazaphospholes	
	R. K. Bansal and Neelima Gupta	743
13.23	Product Class 23: Diazadiphospholes	
	S. J. Collier	757
13.24	Product Class 24: Tetraphospholes	
	S. J. Collier	763
13.25	Product Class 25: Tetraazaphospholes	
	S. J. Collier	767
13.26	Product Class 26: Pentaphospholes and Pentarsoles	
	R. K. Bansal and Neelima Gupta	771
13.27	Product Class 27: Selenazoles and Tellurazoles Containing One or More Other Heteroatoms	
	R. A. Aitken	777
13.28	Product Class 28: Oxatriazoles	
	M. Begtrup	823
13.29	Product Class 29: Thiatriazoles	
	M. Begtrup	833
13.30	Product Class 30: Tetrazoles	
	A. F. Brigas	861
13.31	Product Class 31: Pentazoles	
	R. C. Storr	917

Volume 14: Six-Membered Hetarenes with One Chalcogen

Introduction

	E. J. Thomas	1
14.1	Product Class 1: Pirylium Salts	
	T. S. Balaban and A. T. Balaban	11
14.2	Product Class 2: Benzopyrylium Salts	
	M. Nógrádi	201
14.3	Product Class 3: Pyranones and Pyranthiones	
	K. Afarinkia and V. Vinader	275
14.4	Product Class 4: Benzopyranones and Benzopyranthiones	
	A. C. Williams and N. Camp	347
14.5	Product Class 5: 3-Oxidopyrylium Salts and Their Thio and Benzo-Fused Analogues	
	A. Nelson	639
14.6	Product Class 6: Thiopyrylium Salts	
	W.-D. Rudolf	649
14.7	Product Class 7: Benzothiopyrylium Salts	
	W.-D. Rudolf	719
14.8	Product Class 8: Thiopyranones and Thiopyranthiones	
	S. Faulkner, R. C. Whitehead, and R. J. Aarons	771
14.9	Product Class 9: Benzothiopyranones and Benzothiopyranthiones	
	A. Nelson	787
14.10	Product Class 10: Selenopyrylium and Benzoselenopyrylium Salts	
	P. J. Murphy	817
14.11	Product Class 11: Selenopyranones and Benzoselenopyranones	
	P. J. Murphy	855
14.12	Product Class 12: Telluropyrylium and Benzotelluropyrylium Salts	
	P. J. Murphy	881
14.13	Product Class 13: Telluropyranones and Benzotelluropyranones	
	P. J. Murphy	897

Volume 15: Six-Membered Hetarenes with One Nitrogen or Phosphorus Atom

Introduction

	D. StC. Black	1
--	---------------	---

15.1	Product Class 1: Pyridines	
	D. Spitzner	11
15.2	Product Class 2: Pyridinones and Related Systems	
	P. A. Keller	285
15.3	Product Class 3: Quinolines	
	R. D. Larsen and D. Cai	389
15.4	Product Class 4: Quinolinones	
	R. D. Larsen	551
15.5	Product Class 5: Isoquinolines	
	M. Álvarez and J. A. Joule	661
15.6	Product Class 6: Isoquinolinones	
	M. Álvarez and J. A. Joule	839
15.7	Product Class 7: Quinolizinium Salts and Benzo Analogues	
	H. Ihmels	907
15.8	Product Class 8: Naphthyridines	
	P.-W. Phuan and M. C. Kozlowski	947
15.9	Product Class 9: Acridines	
	R. H. Prager and C. M. Williams	987
15.10	Product Class 10: Acridin-9(10<i>H</i>)-ones and Related Systems	
	R. H. Prager and C. M. Williams	1029
15.11	Product Class 11: Phenanthridines	
	P. A. Keller	1065
15.12	Product Class 12: Phenanthridinones and Related Systems	
	P. A. Keller	1089
15.13	Product Class 13: 1λ^3-Phosphinines	
	F. Mathey and P. Le Floch	1097
15.14	Product Class 14: 1λ^5-Phosphinines	
	R. Streubel	1157
15.15	Product Class 15: Benzo-Fused And Other Annulated Phosphinines	
	U. Bergsträßer	1181

Volume 16: Six-Membered Hetarenes with Two Identical Heteroatoms

Introduction

	Y. Yamamoto	1
16.1	Product Class 1: 1,2-Dioxins and Benzo- and Dibenzo-Fused Derivatives	
	M. Matsumoto	13
16.2	Product Class 2: 1,4-Dioxins and Benzo- and Dibenzo-Fused Derivatives	
	M. Matsumoto	15

16.3	Product Class 3: 1,2-Dithiins	
	R. Sato	39
16.4	Product Class 4: 1,4-Dithiins	
	R. Sato	57
16.5	Product Class 5: 1,2-Diselenins	
	R. Sato	95
16.6	Product Class 6: 1,4-Diselenins	
	R. Sato	103
16.7	Product Class 7: 1,4-Ditellurins	
	R. Sato	119
16.8	Product Class 8: Pyridazines	
	N. Haider and W. Holzer	125
16.9	Product Class 9: Cinnolines	
	N. Haider and W. Holzer	251
16.10	Product Class 10: Phthalazines	
	N. Haider and W. Holzer	315
16.11	Product Class 11: Pyridazino[1,2-<i>a</i>]pyridazines	
	N. Haider and W. Holzer	373
16.12	Product Class 12: Pyrimidines	
	S. von Angerer	379
16.13	Product Class 13: Quinoxalines	
	D. Kikelj	573
16.14	Product Class 14: Pyrazines	
	N. Sato	751
16.15	Product Class 15: Quinoxalines	
	S. Gobec and U. Urleb	845
16.16	Product Class 16: Phenazines	
	U. Urleb and S. Gobec	913
16.17	Product Class 17: Purines	
	F. Seela, N. Ramzaeva, and H. Rosemeyer	945
16.18	Product Class 18: Pyridopyridazines	
	M. Sako	1109
16.19	Product Class 19: Pyridopyrimidines	
	M. Sako	1155
16.20	Product Class 20: Pyridopyrazines	
	M. Sako	1269
16.21	Product Class 21: Pteridines and Related Structures	
	T. Ishikawa	1291
16.22	Product Class 22: Other Diazinodiazines	
	T. Ishikawa	1337

Volume 17: Six-Membered Hetarenes with Two Unlike or More than Two Heteroatoms and Fully Unsaturated Larger-Ring Heterocycles

Introduction

	S. M. Weinreb and Y. R. Mahajan	1
17.1	Product Class 1: Six-Membered Hetarenes with Two Unlike Heteroatoms	
17.1.1	Product Subclass 1: Two Unlike Oxygen, Sulfur, Selenium, or Tellurium Atoms	
	S. Yamazaki and K. Yamamoto	19
17.1.2	Product Subclass 2: One Oxygen and One Nitrogen or Phosphorus Atom	
	H. Ulrich	55
17.1.3	Product Subclass 3: One Sulfur, Selenium, or Tellurium Atom and One Nitrogen or Phosphorus Atom	
	H. Ulrich	117
17.2	Product Class 2: Six-Membered Hetarenes with Three Heteroatoms	
17.2.1	Product Subclass 1: 1,2,3-Triazines and Phosphorus Analogues	
	H. Döpp and D. Döpp	223
17.2.2	Product Subclass 2: 1,2,4-Triazines	
	C. W. Lindsley and M. E. Layton	357
17.2.3	Product Subclass 3: 1,3,5-Triazines and Phosphorus Analogues	
	S. von Angerer	449
17.3	Product Class 3: Six-Membered Hetarenes with More Than Three Heteroatoms	
	M. Bohle	585
17.4	Product Class 4: Seven-Membered Hetarenes with One Heteroatom	
17.4.1	Product Subclass 1: Oxepins	
	S. von Angerer	627
17.4.2	Product Subclass 2: Benzoxepins	
	S. von Angerer	653
17.4.3	Product Subclass 3: Thiepins and Selenium Analogues	
	A. L. Schwan	705
17.4.4	Product Subclass 4: Benzothiepins and Selenium/Tellurium Analogues	
	A. L. Schwan	717

17.4.5	Product Subclass 5: Azepines, Cyclopentazepines, and Phosphorus Analogues	
	M. D. Surman and R. H. Hutchings	749
17.4.6	Product Subclass 6: Benzazepines and Their Group 15 Analogues	
	J.-P. K. Meigh	825
17.5	Product Class 5: Seven-Membered Hetarenes with Two or More Heteroatoms	
	R. J. Herr	929
17.6	Product Class 6: Eight- and Nine-Membered Hetarenes and Heteroannulenes with One or More Heteroatoms	
	R. M. Borzilleri	979
17.7	Product Class 7: Cyclazines	
	Y. Tominaga	1025
17.8	Product Class 8: Porphyrins and Related Compounds	
	K. M. Smith and M. G. H. Vicente	1081
17.9	Product Class 9: Phthalocyanines and Related Compounds	
	N. B. McKeown	1237