

## Tetrahedron Symposia-in-Print

### Series Editor

Professor H. H. Wasserman, Department of Chemistry, Yale University, P.O. Box 208107, New Haven, CT 06520-8107, U.S.A.

*Tetrahedron Symposia-in-Print* comprise collections of original research papers covering timely areas of organic chemistry.

Each symposium is organized by a Symposium Editor who will invite authors, active in the selected field, to submit original articles covering current research, complete with experimental sections. These papers will be rapidly reviewed and processed for publication by the Symposium Editor under the usual refereeing system.

Authors who have not already been invited, and who may have obtained recent significant results in the area of the announced symposium, may also submit contributions for Editorial consideration and possible inclusion. Before submitting such papers authors should send an abstract to the Symposium Editor for preliminary evaluation. Firm deadlines for receipt of papers will allow sufficient time for completion and presentation of ongoing work without loss of the freshness and timeliness of the research results.

### Symposia-in-Print—already published

- Recent trends in organic photochemistry, Albert Padwa, Ed. *Tetrahedron* **1981**, 37, 3227–3420.
- New general synthetic methods, E. J. Corey, Ed. *Tetrahedron* **1981**, 37, 3871–4119.
- Recent developments in polycyclopentanoid chemistry, Leo A. Paquette, Ed. *Tetrahedron* **1981**, 37, 4357–4559.
- Biradicals, Josef Michl, Ed. *Tetrahedron* **1982**, 38, 733–867.
- Electron-transfer initiated reactions, Gary B. Schuster, Ed. *Tetrahedron* **1982**, 38, 1025–1122.
- The organic chemistry of animal defense mechanisms, Jerrold Meinwald, Ed. *Tetrahedron* **1982**, 38, 1853–1970.
- Recent developments in the use of silicon in organic synthesis, Hans Reich, Ed. *Tetrahedron* **1983**, 39, 839–1009.
- Linear tetrapyrroles, Ray Bonnett, Ed. *Tetrahedron* **1983**, 39, 1837–1954.
- Heteroatom-directed metallations in heterocyclic synthesis, George R. Newkome, Ed. *Tetrahedron* **1983**, 39, 1955–2091.
- Recent aspects of the chemistry of  $\beta$ -lactams, J. E. Baldwin, Ed. *Tetrahedron* **1983**, 39, 2445–2608.
- New spectroscopic techniques for studying metabolic processes, A. I. Scott, Ed. *Tetrahedron* **1983**, 39, 3441–3626.
- New developments in indole alkaloids, Martin E. Kuehne, Ed. *Tetrahedron* **1983**, 39, 3627–3780.
- Recent aspects of the chemistry of nucleosides, nucleotides and nucleic acids, Colin B. Reese, Ed. *Tetrahedron* **1984**, 40, 1–164.
- Bioorganic studies on receptor sites, Koji Nakanishi, Ed. *Tetrahedron* **1984**, 40, 455–592.
- Synthesis of chiral non-racemic compounds, A. I. Meyers, Ed. *Tetrahedron* **1984**, 40, 1213–1418.
- Control of acyclic stereochemistry, Teruaki Mukaiyama, Ed. *Tetrahedron* **1984**, 40, 2197–2344.
- Recent aspects of anthracyclinone chemistry, T. Ross Kelly, Ed. *Tetrahedron* **1984**, 40, 4537–4794.
- The organic chemistry of marine products, Paul J. Scheuer, Ed. *Tetrahedron* **1985**, 41, 979–1108.
- Recent aspects of carbene chemistry, Matthew Platz, Ed. *Tetrahedron* **1985**, 41, 1423–1612.
- Recent aspects of singlet oxygen chemistry of photooxidation, Isao Saito and Teruo Matsuura, Eds. *Tetrahedron* **1985**, 41, 2037–2236.
- Synthetic applications of dipolar cycloaddition reactions, Wolfgang Oppolzer, Ed. *Tetrahedron* **1985**, 41, 3447–3568.
- Selectivity and synthetic applications of radical reactions, Bernd Giese, Ed. *Tetrahedron* **1985**, 41, 3887–4302.
- Recent aspects of organoselenium chemistry, Dennis Liotta, Ed. *Tetrahedron* **1985**, 41, 4727–4890.
- Application of newer organometallic reagents to the total synthesis of natural products, Martin Semmelhack, Ed. *Tetrahedron* **1985**, 41, 5741–5900.
- Formal transfers of hydride from carbon–hydrogen bonds, James D. Wuest, Ed. *Tetrahedron* **1986**, 42, 941–1208.
- Synthesis of non-natural products: challenge and reward, Philip E. Eaton, Ed. *Tetrahedron* **1986**, 42, 1549–1916.
- New synthetic methods—II, F. E. Ziegler, Ed. *Tetrahedron* **1986**, 42, 2777–3028.
- Structure and reactivity of organic radical ions, Heinz D. Roth, Ed. *Tetrahedron* **1986**, 42, 6097–6350.
- Organic chemistry in anisotropic media, V. Ramamurthy, J. R. Scheffer and N. J. Turro, Eds. *Tetrahedron* **1987**, 43, 1197–1746.
- Current topics in sesquiterpene synthesis, John W. Huffman, Ed. *Tetrahedron* **1987**, 43, 5467–5722.
- Peptide chemistry: design and synthesis of peptides, conformational analysis and biological functions, Victor J. Hruby and Robert Schwyzler, Eds. *Tetrahedron* **1988**, 44, 661–1006.
- Organosilicon chemistry in organic synthesis, Ian Fleming, Ed. *Tetrahedron* **1988**, 44, 3761–4292.
- $\alpha$ -Amino acid synthesis, Martin J. O'Donnell, Ed. *Tetrahedron* **1988**, 44, 5253–5614.
- Physical-organic/theoretical chemistry: the Dewar interface, Nathan L. Bauld, Ed. *Tetrahedron* **1988**, 44, 7335–7626.
- Recent developments in organocopper chemistry, Bruce H. Lipshutz, Ed. *Tetrahedron* **1989**, 45, 349–578.
- Organotin compounds in organic synthesis, Yoshinori Yamamoto, Ed. *Tetrahedron* **1989**, 45, 909–1230.
- Mycotoxins, Pieter S. Steyn, Ed. *Tetrahedron* **1989**, 45, 2237–2464.
- Strain-assisted syntheses, Léon Ghosez, Ed. *Tetrahedron* **1989**, 45, 2875–3232.
- Covalently linked donor-acceptor species for mimicry of photosynthetic electron and energy transfer, Devens Gust and Thomas A. Moore, Eds. *Tetrahedron* **1989**, 45, 4669–4912.
- Aspects of modern carbohydrate chemistry, S. Hanessian, Ed. *Tetrahedron* **1990**, 46, 1–290.

41. Nitroalkanes and nitroalkenes in synthesis, Anthony G. M. Barrett, Ed. *Tetrahedron* **1990**, 46, 7313–7598.
42. Synthetic applications of anodic oxidations, John S. Swenton and Gary W. Morrow, Eds. *Tetrahedron* **1991**, 47, 531–906.
43. Recent advances in bioorganic chemistry, Dale L. Boger, Ed. *Tetrahedron* **1991**, 47, 2351–2682.
44. Natural product structure determination, R. B. Bates, Ed. *Tetrahedron* **1991**, 47, 3511–3664.
45. Frontiers in natural products biosynthesis. Enzymological and molecular genetic advances, D. E. Cane, Ed. *Tetrahedron* **1991**, 47, 5919–6078.
46. New synthetic methods—III, S. E. Denmark, Ed. *Tetrahedron* **1992**, 48, 1959–2222.
47. Organotitanium reagents in organic chemistry, M. T. Reetz, Ed. *Tetrahedron* **1992**, 48, 5557–5754.
48. Total and semi-synthetic approaches to taxol, J. D. Winkler, Ed. *Tetrahedron* **1992**, 48, 6953–7056.
49. Synthesis of optically active compounds—prospects for the 21st century, Kenji Koga and Takayuki Shioiri, Eds. *Tetrahedron* **1993**, 49, 1711–1924.
50. Peptide secondary structure mimetics, Michael Kahn, Ed. *Tetrahedron* **1993**, 49, 3433–3689.
51. Transition metal organometallics in organic synthesis, Anthony J. Pearson, Ed. *Tetrahedron* **1993**, 49, 5415–5682.
52. Palladium in organic synthesis, Jan-E. Bäckvall, Ed. *Tetrahedron* **1994**, 50, 285–572.
53. Recent progress in the chemistry of enediyne antibiotics, Terrence W. Doyle and John F. Kadow, Eds. *Tetrahedron* **1994**, 50, 1311–1538.
54. Catalytic asymmetric addition reactions, Stephen F. Martin, Ed. *Tetrahedron* **1994**, 50, 4235–4574.
55. Mechanistic aspects of polar organometallic chemistry, Manfred Schlosser, Ed. *Tetrahedron* **1994**, 50, 5845–6128.
56. Molecular recognition, Andrew D. Hamilton, Ed. *Tetrahedron* **1995**, 51, 343–648.
57. Recent advances in the chemistry of zirconocene and related compounds, Ei-ichi Negishi, Ed. *Tetrahedron* **1995**, 51, 4255–4570.
58. Fluoroorganic chemistry: synthetic challenges and bio-medical rewards, Giuseppe Resnati and Vadim A. Soloshonok, Eds. *Tetrahedron* **1996**, 52, 1–330.
59. Novel applications of heterocycles in synthesis, A. R. Katritzky, Ed. *Tetrahedron* **1996**, 52, 3057–3374.
60. Fullerene chemistry, Amos B. Smith III, Ed. *Tetrahedron* **1996**, 52, 4925–5262.
61. New synthetic methods—IV. Organometallics in organic chemistry, István E. Markó, Ed. *Tetrahedron* **1996**, 52, 7201–7598.
62. Cascade reactions, Ron Grigg, Ed. *Tetrahedron* **1996**, 52, 11385–11664.
63. Applications of solid-supported organic synthesis in combinatorial chemistry, James A. Bristol, Ed. *Tetrahedron* **1997**, 53, 6573–6706.
64. Recent applications of synthetic organic chemistry, Stephen F. Martin, Ed. *Tetrahedron* **1997**, 53, 8689–9006.
65. Chemical biology, Gregory L. Verdine and Julian Simon, Eds. *Tetrahedron* **1997**, 53, 11937–12066.
66. Recent aspects of S, Se, and Te chemistry, Richard S. Glass and Renji Okazaki, Eds. *Tetrahedron* **1997**, 53, 12067–12318.
67. Modern organic chemistry of polymerization, H. K. Hall Jr., Ed. *Tetrahedron* **1997**, 53, 15157–15616.
68. New synthetic methods—V, John L. Wood, Ed. *Tetrahedron* **1997**, 53, 16213–16606.
69. New developments in organonickel chemistry, Bruce H. Lipshutz and Tien-Yau Luh, Eds. *Tetrahedron* **1998**, 54, 1021–1316.
70. Solution phase combinatorial chemistry, David L. Coffen, Ed. *Tetrahedron* **1998**, 54, 3955–4150.
71. Heterocycles in asymmetric synthesis, Alexandre Alexakis, Ed. *Tetrahedron* **1998**, 54, 10239–10554.
72. Recent advances of phase-transfer catalysis, Takayuki Shioiri, Ed. *Tetrahedron* **1999**, 55, 6261–6402.
73. Olefin metathesis in organic synthesis, Marc L. Snapper and Amir H. Hoveyda, Eds. *Tetrahedron* **1999**, 55, 8141–8262.
74. Stereoselective carbon–carbon bond forming reactions, Harry H. Wasserman, Stephen F. Martin and Yoshinori Yamamoto, Eds. *Tetrahedron* **1999**, 55, 8589–9006.
75. Applications of combinatorial chemistry, Miles G. Siegel and Stephen W. Kaldor, Eds. *Tetrahedron* **1999**, 55, 11609–11710.
76. Advances in carbon–phosphorus heterocyclic chemistry, François Mathey, Ed. *Tetrahedron* **2000**, 56, 1–164.
77. Transition metal organometallics in organic synthesis, Kenneth M. Nicholas, Ed. *Tetrahedron* **2000**, 56, 2103–2338.
78. Organocopper chemistry II, Norbert Krause, Ed. *Tetrahedron* **2000**, 56, 2727–2904.
79. Carbene complexes in organic chemistry, James W. Herndon, Ed. *Tetrahedron* **2000**, 56, 4847–5044.
80. Recent aspects of the chemistry of  $\beta$ -lactams—II, Marvin J. Miller, Ed. *Tetrahedron* **2000**, 56, 5553–5742.
81. Molecular assembly and reactivity of organic crystals and related structures, Miguel A. Garcia-Garibay, Vaidhyanathan Ramamurthy and John R. Scheffer, Eds. *Tetrahedron* **2000**, 56, 6595–7050.
82. Protein engineering, Richard Chamberlin, Ed. *Tetrahedron* **2000**, 56, 9401–9526.
83. Recent advances in peptidomimetics, Jeffrey Aubé, Ed. *Tetrahedron* **2000**, 56, 9725–9842.
84. New synthetic methods—VI, George A. Kraus, Ed. *Tetrahedron* **2000**, 56, 10101–10282.
85. Oxidative activation of aromatic rings: an efficient strategy for arene functionalization, Stéphane Quideau and Ken S. Feldman, Eds. *Tetrahedron* **2001**, 57, 265–424.
86. Lewis acid control of asymmetric synthesis, Keiji Maruoka, Ed. *Tetrahedron* **2001**, 57, 805–914.
87. Novel aromatic compounds, Lawrence T. Scott and Jay S. Siegel, Eds. *Tetrahedron* **2001**, 57, 3507–3808.
88. Asymmetric synthesis of novel sterically constrained amino acids, Victor J. Hruby and Vadim A. Soloshonok, Eds. *Tetrahedron* **2001**, 57, 6329–6650.
89. Recognition-mediated self-assembly of organic systems, Vincent M. Rotello, Ed. *Tetrahedron* **2002**, 58, 621–844.
90. Synthesis of marine natural products containing polycyclic ethers, Masahiro Hirama and Jon D. Rainier, Eds. *Tetrahedron* **2002**, 58, 1779–2040.
91. Fluorous chemistry, John A. Gladysz and Dennis P. Curran, Eds. *Tetrahedron* **2002**, 58, 3823–4132.
92. Recent developments in chiral lithium amide base chemistry, Peter O'Brien, Ed. *Tetrahedron* **2002**, 58, 4567–4734.
93. Beyond natural product synthesis (Tetrahedron Prize for Creativity in Organic Chemistry 2001 – Yoshito Kishi), Harry H. Wasserman and Stephen F. Martin, Eds. *Tetrahedron* **2002**, 58, 6223–6602.
94. Strained heterocycles as intermediates in organic synthesis, Amy R. Howell, Ed. *Tetrahedron* **2002**, 58, 6979–7194.
95. Molecular design of Lewis and Brønsted acid catalysts—the key to environmentally benign reagents (Tetrahedron Chair 2002), Hisashi Yamamoto, Ed. *Tetrahedron* **2002**, 58, 8153–8364.
96. Recent developments in dendrimer chemistry, David K. Smith, Ed. *Tetrahedron* **2003**, 59, 3787–4024.
97. Art, science and technology in total synthesis (Tetrahedron Prize for Creativity in Organic Chemistry 2002 – K. C. Nicolaou), Stephen F. Martin and Harry H. Wasserman, Eds. *Tetrahedron* **2003**, 59, 6667–7070.

98. New synthetic methods—VII, Brian M. Stoltz, Ed. *Tetrahedron* **2003**, 59, 8843–9030.
99. Oxiranyl and aziridinyl anions as reactive intermediates in synthetic organic chemistry, S. Florio, Ed. *Tetrahedron* **2003**, 59, 9683–9864.
100. Recent advances in rare earth chemistry, Shū Kobayashi, Ed. *Tetrahedron* **2003**, 59, 10339–10598.
101. Biocatalysts in synthetic organic chemistry, S. M. Roberts, Ed. *Tetrahedron* **2004**, 60, 483–806.
102. Recent advances in the chemistry of zirconocenes, Keisuke Suzuki and Peter Wipf, Eds. *Tetrahedron* **2004**, 60, 1257–1424.
103. Atropisomerism, Jonathan Clayden, Ed. *Tetrahedron* **2004**, 60, 4325–4558.
104. Chemistry of biologically and physiologically intriguing phenomena, Daisuke Uemura, Ed. *Tetrahedron* **2004**, 60, 6959–7098.
105. Olefin metathesis: a powerful and versatile instrument for organic synthesis (Tetrahedron prize for creativity in organic chemistry 2003 – R. H. Grubbs), Stephen F. Martin and Harry H. Wasserman, Eds. *Tetrahedron* **2004**, 60, 7099–7438.
106. From synthetic methodology to biomimetic target assembly (Tetrahedron prize for creativity in organic chemistry 2003 – D. Seebach), Léon A. Ghosez, Ed. *Tetrahedron* **2004**, 60, 7439–7794.
107. Solid and solution phase combinatorial chemistry, Rolf Breinbauer and Herbert Waldmann, Eds. *Tetrahedron* **2004**, 60, 8579–8738.
108. Catalytic tools enabling total synthesis (Tetrahedron Chair 2004), Alois Fürstner, Ed. *Tetrahedron* **2004**, 60, 9529–9784.
109. Synthesis and applications of non-racemic cyanohydrins and  $\alpha$ -amino nitriles, Michael North, Ed. *Tetrahedron* **2004**, 60, 10371–10568.
110. Synthetic receptors as sensors, Eric V. Anslyn, Ed. *Tetrahedron* **2004**, 60, 11041–11316.
111. Functionalised organolithium compounds, Carmen Nájera and Miguel Yus, Eds. *Tetrahedron* **2005**, 61, 3125–3450.
112. Applications of catalysis in academia and industry, Michael J. Krische, Ed. *Tetrahedron* **2005**, 61, 6155–6472.
113. Development and application of highly active and selective palladium catalysts, Ian J. S. Fairlamb, Ed. *Tetrahedron* **2005**, 61, 9647–9918.
114. Multicomponent reactions, Ilan Marek, Ed. *Tetrahedron* **2005**, 61, 11299–11520.
115. Polymer-supported reagents and catalysts: increasingly important tools for organic synthesis, Patrick Toy and Min Shi, Eds. *Tetrahedron* **2005**, 61, 12013–12192.
116. Organocatalysis in organic synthesis, Pavel Kočovský and Anderi V. Malkov, Eds. *Tetrahedron* **2006**, 62, 243–502.
117. Supramolecular chemistry of fullerenes, Nazario Martín and Jean-François Nierengarten, Eds. *Tetrahedron* **2006**, 62, 1905–2132.
118. Chemistry of electron-deficient ynamines and ynamides, Richard P. Hsung, Ed. *Tetrahedron* **2006**, 62, 3771–3938.
119. Microwave assisted organic synthesis, Nicholas E. Leadbeater, Ed. *Tetrahedron* **2006**, 62, 4623–4732.
120. Nature-inspired approaches to chemical synthesis, Erik J. Sorensen and Emmanuel A. Theodorakis, Eds. *Tetrahedron* **2006**, 62, 5159–5354.
121. The chemistry of radical ions, Paul E. Floreancig, Ed. *Tetrahedron* **2006**, 62, 6447–6594.
122. Recent advances in oxidation chemistry, Dan Yang, Ed. *Tetrahedron* **2006**, 62, 6595–6718.
123. Stereoselective and catalyzed halogenation reactions, Thomas Lectka, Ed. *Tetrahedron* **2006**, 62, 7141–7204.
124. Recent advances in organonickel chemistry, Timothy F. Jamison, Ed. *Tetrahedron* **2006**, 62, 7493–7610.
125. New applications of metal catalysis in natural product synthesis, Kay M. Brummond, Ed. *Tetrahedron* **2006**, 62, 10467–10602.
126. Organic chemistry of singlet oxygen, Alexander Greer, Ed. *Tetrahedron* **2006**, 62, 10603–10776.
127. Organocatalysis and new chemical concepts (Tetrahedron Young Investigator Award – David MacMillan), Stephen F. Martin, Ed. *Tetrahedron* **2006**, 62, 11283–11520.
128. Fluorescent nucleoside analogs: synthesis, properties and applications, Yitzhak Tor, Ed. *Tetrahedron* **2007**, 63, 3415–3614.
129. Celebrating the 50th anniversary of Tetrahedron 1957–2007 (Parts 1–3), Stephen F. Martin, Ed. *Tetrahedron* **2007**, 63, 5691–6660.
130. Low molecular weight organic gelators, David K. Smith, Ed. *Tetrahedron* **2007**, 63, 7271–7494.
131. New reactions and catalysts: development and applications (Tetrahedron prize for creativity in organic chemistry 2006 – H. Yamamoto), Stephen F. Martin, Ed. *Tetrahedron* **2007**, 63, 8359–8676.
132. New trends in calixarene chemistry, Jack Harrowfield and Jacques Vicens, Eds. *Tetrahedron* **2007**, 63, 10709–10852.
133. Cycloaddition and benzannulation approaches to functionalised aromatic compounds, Joseph P. A. Harrity, Ed. *Tetrahedron* **2008**, 64, 757–968.
134. Natural Product Synthesis, Martin Banwell, Ed. *Tetrahedron* **2008**, 64, 4659–4896.
135. Catalytic Aromatic C–H Activation, Robin Bedford, Ed. *Tetrahedron* **2008**, 64, 5963–6138.
136. Synthetic Advances in Transition Metal-Catalyzed Bond-Forming Reactions, John Hartwig, Ed. *Tetrahedron* **2008**, 64, 6811–7026.
137. 2007 Tetrahedron Prize for Creativity in Organic Chemistry, Big and Little Meccano, Ed. *Tetrahedron* **2008**, 64, 8229; Synthetic NanoSystems and NanoMachinery, Fraser Stoddart, Ed. *Tetrahedron* **2008**, 64, 8231–8570.
138. The Synthesis of Carbon-rich Nanomolecules, Rik R. Tykwinski and Jean-François Nierengarten, Eds. *Tetrahedron* **2008**, 64, 11349–11516.
139. Modern Radical Methodology in Organic Synthesis, Andreas Gansäuer, Ed. *Tetrahedron* **2008**, 64, 11811–11944.
140. Recent Developments in Gold Catalysis, Fabien Gagosz, Ed. *Tetrahedron* **2009**, 65, 1747–1928.
141. Tetrahedron Young Investigator Award 2008 Recent Advances in Synthetic Methodology: Development and Applications J. Du Bois, Stephen F. Martin, Ed. *Tetrahedron* **2009**, 65, 3027–3314.
142. Tetrahedron Young Investigator Award 2009 Recent Advances in Catalysis and Green Chemistry Michael J. Krische, Stephen F. Martin, Ed. *Tetrahedron* **2009**, 65, 4937–5132.
143. Recent Advances in Organosilicon Chemistry Directed towards Organic Synthesis, Peter Langer, Ed. *Tetrahedron* **2009**, 65, 5445–5614.
144. 2008 Tetrahedron Prize for Creativity in Organic Chemistry. The Art of Synthesis: Methods, Strategies and Applications Professor Larry E. Overman, Stephen F. Martin, Ed. *Tetrahedron* **2009**, 65, 6417–6754.
145. Molecular Container Chemistry, Ralf Warmuth, Ed. *Tetrahedron* **2009**, 65, 7197–7316.