

## Original Papers

1. Shigehiko SUGASAWA and Yuichi KANAOKA, Application of the Robinson Dehydrogenation Reaction. I. A Synthesis of 2,3-Dimethoxy-6*H*-indolo[2,1-*a*]isoindole, *Pharm.Bull.*, **3**, 266-270 (1955).
2. Shigehiko SUGASAWA, Masanao TERASHIMA, and Yuichi KANAOKA, A Synthesis of 1,2-Tetramethylene-3,4-dihydro- $\beta$ -carboline, *Pharm.Bull.*, **4**, 16-19 (1956).
3. Ichiro OMURA, Hiroaki BABA, Ken-ichi HIGASHI, and Yuichi KANAOKA, Ionization Potentials of Some Organic Molecules. V. Heterocyclic Compounds Containing Nitrogen, *Bull.Chem.Soc.Jap.*, **30**, 633-637 (1957).
4. Yuichi KANAOKA, Application of the Robinson Dehydrogenation Reaction. II. Oxidative Cyclization of Some Phenethyl- and Phenylpropyl-amines, *Chem.Pharm.Bull.*, **7**, 589-594 (1959).
5. Yuichi KANAOKA, Application of the Robinson Dehydrogenation Reaction. III. Synthesis of 2,3,9,10-Tetramethoxy-5,6,6a,7,12,13-hexahydro-13-methyldibenzo[*b,f*]quinolinium Iodide, *Chem.Pharm.Bull.*, **7**, 595-597 (1959).
6. Yuichi KANAOKA, Application of the Robinson Dehydrogenation Reaction. IV. Oxidation of Some Tetrahydro- $\beta$ -carboline Derivatives, *Chem.Pharm.Bull.*, **7**, 597-601 (1959).
7. Yuichi KANAOKA, Application of the Robinson Dehydrogenation Reaction. V (Supplement to Part I). Synthesis of 2,3-Dimethoxy-5-methyl-10b,11-dihydro-6*H*-indolo[2,1- $\alpha$ ]isoindolium Iodide, *Chem.Pharm.Bull.*, **7**, 647 (1959).
8. Yuichi KANAOKA, Masanao TERASHIMA, and Tetsuo KIMURA, An Improved Synthesis of Some Ketones as an Intermediate of 3-Substituted Isoquinoline, *Chem.Pharm.Bull.*, **7**, 648-649 (1959).
9. Yuichi KANAOKA, Yoshio BAN, Takeshi OISHI, Osamu YONEMITSU, Masanao TERASHIMA, Tetsuo KIMURA, and Masako NAKAGAWA, Infrared Spectra of Some Indole and Pyrrole Compounds, *Chem.Pharm.Bull.*, **8**, 294-301 (1960).
10. Yuichi KANAOKA, Herbert WEISSBACH, Thomas E. SMITH, and Bernhard WITKOP, Oxidation of Kynuramine Derivatives by Monoamine Oxidase and the Enzymatic Conversion of Dihydronekynuramine to Indigo, *J.Am.Chem.Soc.*, **83**, 732-736 (1961).
11. Yuichi KANAOKA, Takamitsu SEKINE, Minoru MACHIDA, Yaeko SOHMA, Kazutaka TANIZAWA, and Yoshio BAN, Studies on Protein-Sulfhydryl Reagents. I. Synthesis of Benzimidazole Derivatives of Maleimide; Fluorescent Labeling of Maleimide, *Chem.Pharm.Bull.*, **12**, 127-134 (1964).
12. Yuichi KANAOKA, Osamu YONEMITSU, Kazutaka TANIZAWA, and Yoshio BAN, Polyphosphate Esters as Synthetic Reagent. I. Synthesis of 2-Substituted Benzimidazoles, *Chem.Pharm.Bull.*, **12**, 773-778 (1964).
13. Yuichi KANAOKA, Eisuke SATO, Osamu YONEMITSU, and Yoshio BAN, Bischler-Napieralski Reaction by Means of Polyphosphate Esters and Synthesis of 5*H*-2-Benzazepine Derivatives, *Tetrahedron Lett.*, 2419-2422 (1964).

14. Yuichi KANAOKA, Osamu YONEMITSU, Kazutaka TANIZAWA, Kiyoko MATSUZAKI, and Yoshio BAN, A Novel Preparation of Aryl Esters, *Chem.Ind.(London)*, 2102 (1964).
15. Yuichi KANAOKA, Yoshio BAN, Osamu YONEMITSU, Kimiko IRIE, and Koichi MIYASHITA, Fischer Indole Synthesis and Ethylation of 2,3-Disubstituted Indoles with Polyphosphate Esters, *Chem.Ind.(London)*, 473 (1965).
16. Yoshio BAN, Yasuhiko SATO, Ichizo INOUE, Masako NAGAI, Takeshi OISHI, Masanao TERASHIMA, Osamu YONEMITSU, and Yuichi KANAOKA, Total Synthesis of (+)-Aspidospermine, *Tetrahedron Lett.*, 2261-2268 (1965).
17. Yuichi KANAOKA, Minoru MACHIDA, Osamu YONEMITSU, and Yoshio BAN, Polyphosphate Esters as a Synthetic Agent. III. Amide and Peptide Syntheses, *Chem.Pharm.Bull.*, **13**, 1065-1072 (1965).
18. John W. DALY, J. BENIGNI, R. MINNIS, Yuichi KANAOKA, and Bernhard WITKOP, Synthesis and Metabolism of 6-Hydroxycatechol-amines, *Biochemistry*, **4**, 2513-2525 (1965).
19. Yuichi KANAOKA, Yoshio BAN, Koichi MIYASHITA, Kimiko IRIE, and Osamu YONEMITSU, Polyphosphate Ester as a Synthetic Agent. V. The Fischer Indole Synthesis with Polyphosphate Ester, *Chem.Pharm.Bull.*, **14**, 934-939 (1966).
20. Yuichi KANAOKA, Eisuke SATO, and Yoshio BAN, Polyphosphate Ester as a Synthetic Agent. VI. The Bischler-Napieralski Reaction of Tryptamine and Tryptophan Derivatives by Means of Polyphosphate Ester, *Chem.Pharm.Bull.*, **15**, 101-107 (1967).
21. Yuichi KANAOKA, Kazutaka TANIZAWA, Eisuke SATO, Osamu YONEMITSU, and Yoshio BAN, Polyphosphate Ester as a Synthetic Agent. IV. A Novel Preparation of Aryl Esters, *Chem.Pharm.Bull.*, **5**, 593-595 (1967).
22. Yuichi KANAOKA, Miwako OCHIAI, and Yoshio BAN, A Synthesis of Dibenzo[*a,h*]quinolizidine System by Way of Immonium Salt Intermediate, *Chem.Pharm.Bull.*, **15**, 822-825 (1967).
23. Yuichi KANAOKA, Minoru MACHIDA, Yoshio BAN, and Takamitsu SEKINE, Fluorescence and Structure of Proteins as Measured by Incorporation of Fluorophore. II. Synthesis of Maleimide Derivatives as Fluorescence-labeled Protein-sulfhydryl Reagents, *Chem.Pharm.Bull.*, **15**, 1738-1743 (1967).
24. Yuichi KANAOKA, Osamu YONEMITSU, Eisuke SATO, and Yoshio BAN, Polyphosphate Ester as a Synthetic Agent. VII. The Beckmann Rearrangement and Formation of Amidines with PPE, *Chem.Pharm.Bull.*, **16**, 280-284 (1968).
25. Yuichi KANAOKA, Eisuke SATO, and Osamu YONEMITSU, Amino Acids and Peptides. II. Cyclodehydration of Some Tryptophan-Dipeptides and Their Derivatives with Polyphosphate Ester, *Tetrahedron*, **24**, 2591-2594 (1968).
26. Osamu YONEMITSU, Tatsuo HAMADA, and Yuichi KANAOKA, Amino Acids and Peptides. IV. Selective Reduction of Peptide-Ester Groups, *Tetrahedron Lett.*, 575-3578 (1968).

27. Yuichi KANAOKA, Eisuke SATO, and Osamu YONEMITSU, Photo-Induced Dehydrogenation of 3,4-Dehydro- $\beta$ -carboline System, *Chem.Ind.*, 1250 (1968).
28. Yuichi KANAOKA, Minoru MACHIDA, Hiroshi KOKUBUN, and Takamitsu SEKINE, Fluorescence and Structure of Proteins as Measured by Incorporation of Fluorophore. III. Fluorescence Characteristics of *N*-[*p*-(2-benzoxazoylyl)phenyl]maleimide and the Derivatives, *Chem.Pharm.Bull.*, **16**, 1747-1753 (1968).
29. Kazutaka TANIZAWA, Shin-ichi ISHII, and Yuichi KANAOKA, Trypsin Substrates Derived from Benzamidine: Application to Active Site Titration and Isolation of Acyl-enzyme Intermediate, *Biochem.Biophys.Res.Commun.*, **32**, 893-897 (1968).
30. Yuichi KANAOKA, Mikiko MACHIDA, and Minoru MACHIDA, Amino Acids and Peptides. III. Synthesis of Some Glycine-oligopeptides by Way of Pentachlorophenyl Esters, *Chem.Pharm.Bull.*, **16**, 2160-2166 (1968).
31. Osamu YONEMITSU, Yohmei OKUNO, Yuichi KANAOKA, Isabella L. KARLE, and Bernhard WITKOP, Photocyclizations of Pharmacodynamic Amines. II. X-ray Analysis of a Noncentrosymmetric Tetracyclic Indole, *J.Am.Chem.Soc.*, **90**, 6522-6523 (1968).
32. Osamu YONEMITSU, Koichi MIYASHITA, Yoshio BAN, and Yuichi KANAOKA, Polyphosphate Ester as a Synthetic Agent. IX. A Novel Synthesis of Ethylindolenines by Ethylation of 2,3-Disubstituted Indoles with Polyphosphate Ester, *Tetrahedron*, **25**, 95-100 (1969).
33. Yuichi KANAOKA, Koichi MIYASHITA, and Osamu YONEMITSU, 3*H*-Indoles. II. Synthesis of 3-Alkyl-3*H*-indoles by the Alkylation of 2,3-Disubstituted Indoles with Polyphosphate Ester and Some Reactions of the 3*H*-Indole System, *Tetrahedron*, **25**, 2757-2766 (1969).
34. Osamu YONEMITSU, Tatsuo HAMADA, and Yuichi KANAOKA, Esterification of Peptides in Aqueous Solution, *Tetrahedron Lett.*, 1819-1820 (1969).
35. Yuichi KANAOKA, Eisuke SATO, Masato AIURA, Osamu YONEMITSU, and Yoshihisa MIZUNO, Alkylation of Nucleosides in Aqueous Solution, *Tetrahedron Lett.*, 3361-3363 (1969).
36. Eisuke SATO and Yuichi KANAOKA, Photoreduction of 4- and 2-Thiouracil and 4-Thiouridine, *Tetrahedron Lett.*, 3547-3548 (1969).
37. Osamu YONEMITSU, Hideo NAKAI, Yuichi KANAOKA, Isabella L. KARLE, and Bernhard WITKOP, Photocyclizations of Pharmacodynamic Amines. III. Three-dimensional Structure of 7-Hydroxy-1,9,10-trimethoxy-4-azabicyclo[5.2.2]undeca-8,10-dien-3-one from Mescaline, *J.Am.Chem.Soc.*, **91**, 4591-4593 (1969).
38. Yuichi KANAOKA, Koichi MIYASHITA, and Osamu YONEMITSU, The Plancher Rearrangement of 2,3-Disubstituted 3*H*-Indoles, *Chem.Commun.*, 1365 (1969).
39. Osamu YONEMITSU, Tatsuo HAMADA, and Yuichi KANAOKA, Selective Reduction of Peptide-ester Groups in Aqueous Solution, *Chem.Pharm.Bull.*, **17**, 2075-2082 (1969).

40. Yuichi KANAOKA, Kazutaka TANIZAWA, and Osamu YONEMITSU, Polyphosphate Ester as a Synthetic Agent. XI. Synthesis of 2-(1-Aminoalkyl)benzimidazoles from *N*-Benzoylamino Acids, *Chem.Pharm.Bull.*, **17**, 2381-2383 (1969).
41. Yuichi KANAOKA, Takeshi KUGA, and Kazutaka TANIZAWA, Polyphosphate Ester as a Synthetic Agent. XII. A Convenient Synthesis of Nitriles by the Dehydration of Amides with PPE, *Chem.Pharm.Bull.*, **18**, 397-399 (1970).
42. Yuichi KANAOKA, Tatsuo HAMADA, and Osamu YONEMITSU, Polyphosphate Ester as a Synthetic Agent. XIII. Syntheses of 2-Substituted Benzoxazoles and Benzthiazoles with PPE, *Chem.Pharm.Bull.*, **18**, 587-590 (1970).
43. Yuichi KANAOKA, Koichi MIYASHITA, and Osamu YONEMITSU, 3*H*-Indoles. IV. Photo- and Peroxide-induced Oxygenation of 2-Ethyl-3*H*-indoles, *Chem.Pharm.Bull.*, **18**, 634-637 (1970).
44. Yuichi KANAOKA, Kazuhiko ITOH, Eisuke SATO, Akihiko NOMURA, and Yoshihisa MIZUNO, Hydrogen Fluoride as an Agent in Organic Reactions. I. Degradation of Polynucleotides with Liquid Hydrogen Fluoride, *Chem.Pharm.Bull.*, **18**, 1475-1477 (1970).
45. Kazutaka TANIZAWA, Shin-ichi ISHII, and Yuichi KANAOKA, Proteolytic Enzymes. II. Studies on the Requirement for the Active Center of Trypsin with Amidinobenzoates as Substrates, *Chem.Pharm.Bull.*, **18**, 2247-2252 (1970).
46. Kazutaka TANIZAWA, Shin-ichi ISHII, and Yuichi KANAOKA, Proteolytic Enzymes. III. *trans*-4-Aminomethylcyclohexane-1-carboxylic Acid Derivatives as Substrates and an Active Site Titrant of Trypsin, *Chem.Pharm.Bull.*, **18**, 2346-2348 (1970).
47. Kazutaka TANIZAWA, Shin-ichi ISHII, Kozo HAMAGUCHI, Yuichi KANAOKA, and Tokuzi IKENAKA, Proteolytic Enzymes. V. Further Application of *p*-Nitrophenyl *p*-Amidinobenzoate as a Titrant of Trypsin, *Chem.Pharm.Bull.*, **18**, 2571-2573 (1970).
48. Yuichi KANAOKA, Minoru MACHIDA, Kimiyo ANDO, and Takamitsu SEKINE, Fluorescence and Structures of Proteins as Measured by Incorporation of Fluorophore. IV. Synthesis and Fluorescence Characteristics of *N*-(*p*-2-Benzimidazolyl)-phenyl)maleimide, *Biochim.Biophys.Acta.*, **207**, 269-277 (1970).
49. Hitoshi NAKAYAMA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Modification of Carboxyl Groups in the Binding Site of Trypsin with the Meerwein Reagent, *Biochem.Biophys.Res.Comm.*, **40**, 537-541 (1970).
50. Osamu YONEMITSU, Yohmei OKUNO, Yuichi KANAOKA, and Bernhard WITKOP, Photocyclization of Pharmacodynamic Amines. IV. Novel Heterocycles from *N*-Chloroacetyl-3,4-dimethoxy-phenethylamine, *J.Am.Chem.Soc.*, **92**, 5686-5690 (1970).
51. Osamu YONEMITSU, Hideo NAKAI, Yuichi KANAOKA, Isabella L. KARLE, and Bernhard WITKOP, Photocyclizations of Pharmacodynamic Amines. V. Unusual Rearrangements of the Mescaline Skeleton, *J.Am.Chem.Soc.*, **92**, 5691-5700 (1970).
52. Eisuke SATO, Koichi KOYAMA, and Yuichi KANAOKA, Photoinduced Reactions. IV. Photoreduction of Uracil Derivatives in Formic Acid, *Chem.Pharm.Bull.*, **19**, 837-839 (1971).

53. Eisuke SATO and Yuichi KANAOKA, Reaction of Thiouracil and Thiouridine with 2-Hydroxy-5-nitrobenzyl Bromide, *Biochim.Biophys.Acta*, **232**, 213-216 (1971).
54. Yuichi KANAOKA, Masato AIURA, and Sachiko HARIYA, Direct Conversion of *N*-Methylindoles into Indoxyl, Oxindole. and Dioxindole *O*-Benzoates, *J.Org.Chem.*, **36**, 458-460 (1971).
55. Koichi KIMURA, Akira WATANABE, Minoru MACHIDA, and Yuichi KANAOKA, Chemical Evidence Showing Involvement of Sulfhydryl Groups in Protein Synthesis with *E. coli* System, *Biochem.Biophys.Res.Comm.*, **43**, 882-887 (1971).
56. Kazutaka TANIZAWA, Shin-ichi ISHII, Kozo HAMAGUCHI, and Yuichi KANAOKA, Proteolytic Enzymes. VI. Aromatic Amidines as Competitive Inhibitors of Trypsin, *J.Biochem.*, **69**, 893-899 (1973).
57. Yuichi KANAOKA and Kazuhiko ITOH, Synthesis of Heterocyclic-Condensed Quinolones by Oxidative Photochemical Cyclization of Amide Systems, *Synthesis*, 35-36 (1972).
58. Takamitsu SEKINE, Kimiyo ANDO, Minoru MACHIDA, and Yuichi KANAOKA, Fluorescent Thiol Reagents. V. Microfluorometry of Thiol Compounds with a Fluorescent-labeled Maleimide, *Anal.Biochem.*, **48**, 557-568 (1972).
59. Yuichi KANAOKA and Koichi KOYAMA, Photochemistry of the Phthalimide System: Reduction, Addition, and Cyclization, *Tetrahedron Lett.*, 4517-4520 (1972).
60. Yuichi KANAOKA and Yoshihiro MIGITA, Photochemistry of the Phthalimide System. III. Photocyclization with Favored  $\delta$ -Hydrogen Abstraction, *Tetrahedron Lett.*, 51-54 (1973).
61. Yuichi KANAOKA, Yoshihiro MIGITA, and Koichi KOYAMA, Photochemistry of the Phthalimide System. IV. Photocyclization of *N*-Alkylphthalimides to Benzazepinone Lactams: Unusual Two-fold Norrish Type II Reactions, *Tetrahedron Lett.*, 1193-1196 (1973).
62. Yasuhiko SATO, Hideo NAKAI, Hiroshi OGIWARA, Tomishige MIZOGUCHI, Yoshihiro MIGITA, and Yuichi KANAOKA, Photochemistry of the Phthalimides with a Sulfide Chain: Synthesis of Aza-Cyclols by  $\delta$ ,  $\epsilon$ ,  $\zeta$ , and  $\xi$  Hydrogen Abstraction, *Tetrahedron Lett.*, 4565-4568 (1973).
63. Yasuhiko SATO, Hideo NAKAI, Tomishige MIZOGUCHI, Masazumi KAWANISHI, and Yuichi KANAOKA, Photochemistry of the Phthalimide System. I. Photodecarboxylation of *N*-Phthaloyl- $\alpha$ -amino Acids, *Chem.Pharm.Bull.*, **21**, 1164-1166 (1973).
64. Yuichi KANAOKA, Toshikatsu TSUJI, Kazuhiko ITOH, and Koichi KOYAMA, Photorearrangement of *N,N*-Diacyl Derivatives of Aniline and Naphthylamines, *Chem.Pharm.Bull.*, **21**, 453-454 (1973).
65. Yuichi KANAOKA, Minoru MACHIDA, Mikiko MACHIDA, and Takamitsu SEKINE, Fluorescent Thiol Reagents. VI. *N*-(1-Anilinonaphthyl-4)maleimide; a Fluorescent Hydrophobic Probe Directed to Thiol Groups in Protein, *Biochim.Biophys.Acta*, **317**, 563-568 (1973).

66. Yuichi KANAOKA and Kazuhiko ITOH, Photocyclization of Benzanilides to Phenanthridones with Elimination of the *ortho*-Methoxy-group, *J.C.S.Chem.Commun.*, **18**, 647-648 (1973).
67. Hitoshi NAKAYAMA and Yuichi KANAOKA, A Photoaffinity Labeling of the Active Site of  $\alpha$ -Chymotrypsin with TPKK, *FEBS Lett.*, **37**, 200-202 (1973).
68. Hitoshi NAKAYAMA and Yuichi KANAOKA, Spectrofluorometric Titrants for Trypsin and Chymotrypsin, *Chem.Pharm.Bull.*, **21**, 2804-2805 (1973).
69. Masato AIURA and Yuichi KANAOKA, Oxidation of Pyrroles with Benzoyl Peroxide, *Heterocycles*, **1**, 237-240 (1973).
70. Eisuke SATO and Yuichi KANAOKA, Heterocycles Related to Nucleotides. VI. Photochemistry of Thiopyrimidines: Photoreduction of Thiouracils and Thiouridines with Sodium Borohydride, *Chem.Pharm.Bull.*, **22**, 799-804 (1974).
71. Masato AIURA and Yuichi KANAOKA, Oxidative Functionalization at the Benzylic Carbon of  $\alpha$ -Substituted Indoles with Benzoyl Peroxide, *Heterocycles*, **2**, 319-322 (1974).
72. Kazuhiko ITOH and Yuichi KANAOKA, Photoreactions of Benzoylaminopyridines, *Chem.Pharm.Bull.*, **22**, 1431-1432 (1974).
73. Yuichi KANAOKA, Koichi KOYAMA, J. L. FLIPPEN, Isabella L. KARLE, and Bernhard WITKOP, Photocyclization of *N*-Alicyclic Phthalimides. Synthesis of Multicyclic Benzazepine Systems, *J.Am.Chem.Soc.*, **96**, 4719-4721 (1974).
74. Yuichi KANAOKA and Yasumaru HATANAKA, Photo-Fries Rearrangement of Heteroaromatic Acid Phenyl Esters, *Heterocycles*, **2**, 423-426 (1974).
75. Takamitsu SEKINE, Takao OHYASHIKI, Minoru MACHIDA, and Yuichi KANAOKA, Studies on Calcium Ion-induced Conformation Changes in the Actin-tropomyosin-troponin System by Fluorometry. I. Conformation Changes Around the Fluorescence-labeled Sulfhydryl Group of Actin, *Biochim.Biophys.Acta*, **351**, 205-213 (1974).
76. Takao OHYASHIKI, Takamitsu SEKINE, and Yuichi KANAOKA, Studies on Calcium Ion-induced Conformation Changes in the Actin-tropomyosin-troponin System by Fluorometry. II. Effect of Tropomyosin, Troponin and Calcium Ion on Conformation of Anilinonaphthylmaleimide-labeled F-Actin, *Biochim.Biophys.Acta*, **351**, 214-223 (1974).
77. Takamitsu SEKINE, Kimiyo Ando KATO, Kenji TAKAMORI, Minoru MACHIDA, and Yuichi KANAOKA, Fluorescent Thiol Reagents X. Fluorometric Estimation of the Reactivity of Thiols; Examples in Small Molecular Compounds. Taka-Amylase A and Myosin A, *Biochim.Biophys.Acta*, **354**, 139-147 (1974).
78. Yuichi KANAOKA and Yasumaru HATANAKA, Photoaddition of Ethers and Olefins to *N*-Methylphthalimide, *Chem.Pharm.Bull.*, **22**, 2205-2206 (1974).

79. Hideo NAKAI, Yasuhiko SATO, Hiroshi OGIWARA, Tomishige MIZOGUCHI, and Yuichi KANAOKA, Photochemical Synthesis of an Oxazolo[4,3-*a*]isoindole-1-spiro Ring System, *Heterocycles*, **2**, 621-624 (1974).
80. Yuichi KANAOKA and Yoshihiro MIGITA, Photocyclization of *N*-Aralkylphthalimides: An Example of Possible Synthetic Control in a Heterocyclic Series, *Tetrahedron Lett.*, 3693-3696 (1974).
81. Minoru MACHIDA, Takamitsu SEKINE, and Yuichi KANAOKA, Chemical Modification of Proteins. VI. The Reaction of *N*-(*p*-(2-Benzimidazolyl)phenyl)maleimide (BIPM) with the Thiol Groups of Egg Albumin, *Chem.Pharm.Bull.*, **22**, 2642-2649 (1974) .
82. Masato AIURA and Yuichi KANAOKA, Heterocycles Related to Nucleotides. VII. Reactions of Dimethyluracil and Dimethylthymine with Benzoyl Peroxide, *Chem.Pharm.Bull.*, **22**, 2979-2981 (1974).
83. Minoru MACHIDA, Nobuyuki USHIJIMA, Mikiko I. MACHIDA and Yuichi KANAOKA, *N*-(7-Dimethylamino-4-methyl-coumarinyl)-maleimides (DACM): Novel Fluorescent Thiol Reagents, *Chem.Pharm.Bull.*, **23**, 1385-1386 (1975).
84. Masato AIURA and Yuichi KANAOKA, Oxidation of Pyrroles with Benzoyl Peroxide: Synthesis of Mono- and Di-hydroxypyrrole *O*-Benzoates and Oxidative Cleavage of Pyrrole-2-methanols, *Chem.Pharm.Bull.*, **23**, 2835-2841 (1975)
85. Yuichi KANAOKA, Chieko NAGASAWA, Hideo NAKAI, Yasuhiko SATO, Hiroshi OGIWARA, and Tomishige MIZOGUCHI, Photochemical Synthesis of Indolo[2,1-*a*]isoindole Derivatives by the Cyclization of *N*-(*o*-Tolyl)phthalimides, *Heterocycles*, **3**, 553-556 (1975).
86. Yuichi KANAOKA, Kazuko SAKAI, Ryuji MURATA, and Yasumaru HATANAKA, Photoaddition Reactions of *N*-Methylphthalimide with Toluenes and Amines, *Heterocycles*, **3**, 719-722 (1975).
87. Yuichi KANAOKA, Kazuhiko ITOH, Yasumaru HATANAKA, Judith L. FLIPPEN, Isabella L. KARLE, and Bernhard WITKOP, Synthetic Photochemistry with Heterocyclic Anilides. Stereochemistry of the Intramolecular 1,5-Hydrogen Shifts in Nonoxidative Photo-cyclization of Benzo[*b*]thiophene-2-carboxanilides, *J.Org.Chem.*, **40**, 3001-3003 (1975).
88. Takao OHYASHIKI, Yuichi KANAOKA, and Takamitsu SEKINE, Studies on Calcium Ion-induced Conformation Changes in the Actin-tropomyosin-troponin System by Fluorometry. III. Changes in the Conformation of Tropomyosin Associated with Functional States, *Biochim.Biophys.Acta.*, **420**, 27-36 (1976).
89. Yuichi KANAOKA and Yasumaru HATANAKA, Synthetic Photochemistry with the Imide System. Norrish Type II Cyclization of Alicyclic Imides, *J.Org.Chem.*, **41**, 400-401 (1976).
90. Yasuhiko SATO, Hideo NAKAI, Tomishige MIZOGUCHI, Yasumaru HATANAKA, and Yuichi KANAOKA, Regioselective Remote Photo-Cyclization. Examples of a Photochemical Macrocyclic Synthesis with Sulfide-containing Phthalimides, *J.Am.Chem.Soc.*, **98**, 2349-2351 (1976).

91. Yasuhiko SATO, Hideo NAKAI, Tomishige MIZOGUCHI, and Yuichi KANAOKA, A Synthetic Approach to Cyclic Peptide Models by Regioselective Remote Photocyclization of Sulfide-Containing Phthalimide, *Tetrahedron Lett.*, 1889-1890 (1976).
92. Yuichi KANAOKA, Tetsuo TAKAHASHI, Minoru MACHIDA, Keiichi YAMAMOTO, and Takamitsu SEKINE, *N*-(3-Fluoranthyl)maleimide (FAM): A Medium Lifetime Fluorescent Thiol Reagent, *Chem.Pharm.Bull.*, **24**, 1417-1419 (1976).
93. Minoru MACHIDA, Mitsue BANDO, Yoshihiro MIGITA, Mikiko I. MACHIDA, and Yuichi KANAOKA, Screening Search for Fluorescent Thiol Reagents: Syntheses of *N*-Naphthylmaleimide Derivatives with a Dimethylamino or a Methoxy Group as an Auxochrome and Their Electronic Spectra, *Chem.Pharm.Bull.*, **24**, 3045-3057 (1976).
94. Yuichi KANAOKA, Sadao NAKAO, and Yasumaru HATANAKA, Stereochemistry of Nonoxidative Photocyclization of Indole-2-carboxanilides to an Indolo[2,3-*c*]quinoline System, *Heterocycles*, **5**, 261-266 (1976)
95. Yuichi KANAOKA, Kunio SAN-NOHE, Yasumaru HATANAKA, Kazuhiko ITOH, Minoru MACHIDA, and Masanao TERASHIMA, Syntheses of Thieno[2,3-*c*]-, Pyrrolo[2,3-*c*]-, and Indolo[2,3-*c*]-diazanaphthalenes by Photocyclization of Acylaminopyridines, *Heterocycles*, **6**, 29-32 (1977).
96. Yuichi KANAOKA, Tetsuo TAKAHASHI, and Hitoshi NAKAYAMA, A New Fluorogenic Substrates for Aminopeptidase, *Chem.Pharm.Bull.*, **25**, 362-363 (1977).
97. Minoru MACHIDA, Nobuyuki USHIJIMA, Tetsuo TAKAHASHI, and Yuichi KANAOKA, A Novel Fluorescent Thiol Reagent: Syntheses and Electronic Spectra of *N*-(7-Dimethylamino-4-methyl)-3-coumarinyl)maleimide (DACM-3) and the Related Compounds, *Chem.Pharm.Bull.*, **25**, 1289-1294 (1977).
98. Minoru MACHIDA, Mikiko I. MACHIDA, Takamitsu SEKINE, and Yuichi KANAOKA, Fluorescence Properties and Reactions of a Novel Fluorescence Thiol Reagent, *N*-(7-Dimethylamino-4-methyl-3-coumarinyl)maleimide (DACM), *Chem.Pharm.Bull.*, **25**, 1678-1684 (1977).
99. Keiichi YAMAMOTO, Takamitsu SEKINE, and Yuichi KANAOKA, Fluorescent Thiol Reagents. XII. Fluorescent Tracer Method for Protein SH Groups Using *N*-(7-Dimethylamino-4-methyl coumarinyl)maleimide. An Application to the Proteins Separated by SDS-Polyacrylamide Gel Electrophoresis, *Anal.Biochem.*, **79**, 83-94 (1977).
100. Yuichi KANAOKA, Organische Fluoreszenzreagentien für die Untersuchung von Enzymen und Proteinen, *Angew.Chem.*, **89**, 142-152 (1977).
101. Yuichi KANAOKA, Organic Fluorescence Reagents in the Study of Enzymes and Proteins, *Angew.Chem.Int.Ed.Engl.*, **16**, 137-147 (1977).
102. Masanao TERASHIMA, Koichi SEKI, Koichi KOYAMA, and Yuichi KANAOKA, Photochemical Synthesis of a Pyridopyrrolo[2,1-*a*]isoindole System by Cyclization of *N*-Methylpyridyl-phthalimides, *Chem.Pharm.Bull.*, **25**, 1591-1595 (1977).



103. Kazutaka TANIZAWA, Yoichi KASABA, and Yuichi KANAOKA, "Inverse Substrates" for Trypsin. Efficient Enzymatic Hydrolysis of Certain Esters with a Cationic Center in the Leaving Group, *J.Am.Chem.Soc.*, **99**, 4485-4488 (1977).
104. Hiroyuki NAKAMURA, Hiroshi WADA, Eisuke SATO, and Yuichi KANAOKA, Dansylation Reaction of Adenosine 3',5'-Cyclic Monophosphate and Other Nucleotides. Chemical Structure of Dansyl Cyclic AMP, *J.Carbohyd.Nucleosides Nucleotides*, **4**, 241-247 (1977)
105. Minoru MACHIDA, Mikiko I. MACHIDA, and Yuichi KANAOKA, Hydrolysis of *N*-Substituted Maleimides: Stability of Fluorescence Thiol Reagents in Aqueous Media, *Chem.Pharm. Bull.*, **25**, 2739-2743 (1977).
106. Minoru MACHIDA, Haruko TAKECHI, and Yuichi KANAOKA, Remote Photocyclization. Photochemical Macrocyclic Synthesis with *N*-( $\omega$ -Methylanilino)alkylphthalimides, *Heterocycles*, **7**, 273-276 (1977).
107. Yuichi KANAOKA, Haruo OKAJIMA, and Yasumaru HATANAKA, Syntheses of Medium-sized Keto-lactam Systems by the Photo-ring-enlargement of *N*-Substituted Alicyclic Imides. *Heterocycles*, **8**, 339-344 (1977).
108. Hideo NAKAI, Yasuhiko SATO, Tomishige MIZOGUCHI, Michio YAMAZAKI, and Yuichi KANAOKA, Photochemistry of Succinimides with an Ether or a Thioether in Their Side-chains  $\gamma$ - and  $\delta$ -Hydrogen Abstraction, *Heterocycles*, **8**, 345-350 (1977).
109. Masanao TERASHIMA, Koichi SEKI, Kazuhiko ITO, and Yuichi KANAOKA, Photoarylation. I. Photochemical Synthesis of Benzothieno[2,3-*c*][1,*x*]diazanaphthalene Systems by Intramolecular Dehydrochlorination, *Heterocycles*, **8**, 421-426 (1977).
110. Yuichi KANAOKA, Tetsuo TAKAHASHI, Hitoshi NAKAYAMA, Katsumi TAKADA, Terutoshi KIMURA, and Shumpei SAKAKIBARA, Synthesis of a Key Fluorogenic Amide, L-Arginine-4-methylcoumaryl-7-amide (L-Arg-MCA) and Its Derivatives. Fluorescence Assays for Trypsin and Papain, *Chem.Pharm.Bull.*, **25**, 3126-3128 (1977).
111. Minoru MACHIDA, Tetsuo TAKAHASHI, Kazuhiko ITOH, Takamitsu SEKINE, and Yuichi KANAOKA, Fluorescence Thiol Reagents: Syntheses and Properties of *N*-Acridinylmaleimides and their Derivatives, *Chem.Pharm.Bull.*, **26**, 596-604 (1978).
112. Masanao TERASHIMA, Koichi KOYAMA, and Yuichi KANAOKA, Photochemical Synthesis of 5,10,11,12,12a,12b-Hexahydro-12b-hydroxyisoindolo[2,1- $\alpha$ ]benz[*cd*]indol-5-one, *Chem.Pharm.Bull.*, **26**, 630-632 (1978).
113. Yuichi KANAOKA and Eisuke SATO, Photochemistry of the Phthalimide System. XVI. Photocyclization of *N*-Methylenebisphthalimides, *Chem.Pharm.Bull.*, **26**, 989-992 (1978).
114. Koji SAIFUKU, Takamitsu SEKINE, Toshihiko NAMIHISA, Tetsuo TAKAHASHI, and Yuichi KANAOKA, A Novel Fluorometric Ultramicro Determination of Serum Leucine Aminopeptidase Using a Coumarine Derivative, *Clin.Chim.Acta*, **84**, 85-91 (1978).
115. Yuichi KANAOKA, Photoreactions of Cyclic Imides. Examples of Synthetic Organic Photochemistry, *Acc.Chem.Res.*, **11**, 407-413 (1978).

116. Kazuhiro MARUYAMA, Yasuo KUBO, Minoru MACHIDA, Kazuaki ODA, Yuichi KANAOKA, and Keiichi FUKUYAMA, Photochemical Cyclization of *N*-2-Alkenyl- and *N*-3-Alkenylphthalimides, *J.Org.Chem.*, **43**, 2303-2304 (1978).
117. Hideoki OGAWA, Akio TANEDA, Takamitsu SEKINE, and Yuichi KANAOKA, The Distribution and Mobility of Sulfhydryl Residues and Disulfide Bonds During Epidermal Keratinization, *Jap.J.Dermatology*, **88**, 525 (1978) (in Japanese).
118. Masanao TERASHIMA, Kazue OHKURA, Haruo OKAJIMA, and Yuichi KANAOKA, Synthesis of Multicyclic Keto Lactams by the Photo-ring-expansion of *N*-(1-Adamantyl)succinimides, *Heterocycles*, **10**, 265-268 (1978).
119. Yuichi KANAOKA, Haruo OKAJIMA, Yasumaru HATANAKA, and Masanao TERASHIMA, Syntheses of Bicyclocaprolactam Systems by the Photo-ring-expansion of *N*-Substituted Succinimides, *Heterocycles*, **11**, 455-460 (1978).
120. Kazutaka TANIZAWA and Yuichi KANAOKA, Determinant of Efficiency of a Monomeric Enzyme: Acceleration by Site-Specific Molecules for Trypsin, *Experientia*, **35**, 16-17 (1979).
121. Yuichi KANAOKA, Kenji YOSHIDA, and Yasumaru HATANAKA, Photoaddition of Olefins to Cyclic Imides: Intermolecular Oxetane Formation and Ring Expansion, *J.Org.Chem.*, **44**, 664-666 (1979).
122. Hideoki OGAWA, Akio TANEDA, Yuichi KANAOKA, and Takamitsu SEKINE, The Histochemical Distribution of Protein Bound Sulfhydryl Groups in Human Epidermis by the New Staining Method, *J.Histochem.Cytochem.*, **27**, 942-946 (1979).
123. Yuichi KANAOKA, Haruo OKAJIMA, and Yasumaru HATANAKA, Norrish Type I Reaction of Aliphatic Cyclic Imides. General Reaction Pattern, Competition with Type II Processes, and Some Synthetic Applications, *J.Org.Chem.*, **44**, 1749-1751 (1979).
124. Hitoshi NAKAYAMA, Masayuki NOZAWA, and Yuichi KANAOKA, Photo-affinity Labeling. II. Photolysis of Amido Derivatives of Nitrophenyl Azides, *Chem.Pharm.Bull.*, **27**, 2775-2780 (1979).
125. Yuichi KANAOKA, Masato HASEBE, and Yasumaru HATANAKA, Photochemistry of Conjugated Nitrogen-carbonyl Systems. I. Photoaddition of 2-Pyrimidone and Some Properties of the Resulting Ene-Urea System, *Heterocycles*, **13**, 263-266 (1979).
126. Masayuki NOZAWA, Kazutaka TANIZAWA, and Yuichi KANAOKA, "Inverse" Substrates for Butyrylcholinesterase, *Biochim.Biophys.Acta*, **611**, 314-322 (1980).
127. Toshiyuki FUJIOKA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Specific Spin-labeling at Trypsin Active Site; Application of "Inverse Substrate" to the Structural Analysis of the Active Site, *Biochim.Biophys.Acta*, **612**, 205-212 (1980).
128. Kazutaka TANIZAWA, Yoichi KASABA, and Yuichi KANAOKA, Induced Activation in the Deacylation Step of Tryptic Hydrolysis: An Application of "Inverse Substrates" to Mechanistic Studies of the Enzyme, *J.Biochem.*, **87**, 417-427 (1980).

129. Hitoshi NAKAYAMA, Kazutaka TANIZAWA, and Yuichi KANAOKA, A Novel "Induced-fit" Phenomenon. Evidence for Conformational Changes Closely Associated with Efficient Hydrolysis of Acyl Trypsin, *J.Am.Chem.Soc.*, **102**, 3214-3218 (1980).
130. Toshiyuki FUJIOKA, Tsuyoshi SATOH, Kazutaka TANIZAWA, and Yuichi KANAOKA, Tryptic Hydrolysis of  $\omega$ -Amidino  $\alpha$ -Amino Acid (Indospecine) Esters, *J.Biochem.*, **87**, 1229-1234 (1980).
131. Masayuki NOZAWA, Kazutaka TANIZAWA, and Yuichi KANAOKA, "Inverse Substrates" for Trypsin-like Enzymes, *J.Pharm.Dyn.*, **4**, 213-219 (1980).
132. Minoru MACHIDA, Kazuaki ODA, Kazuhiro MARUYAMA, Yasuo KUBO, and Yuichi KANAOKA, Photocyclization of *N*-3-Alkenylphthalimides. Effect of Alkyl Substitution on the Formation of Pyrroloisoindoles and Pyridoisoindoles, *Heterocycles*, **14**, 779-782 (1980).
133. Toshihiko NAMIHISA, Kohichi TAMURA, Koji SAIFUKU, Haruo IMANARI, Hiroyuki KURODA, Yuichi KANAOKA, Yoh OKAMOTO, and Takamitsu SEKINE, Fluorescent Staining of the Microfilaments by Heavy Meromyosin Labelled with *N*-(7-Dimethylamino-4-methy]coumarinyl)maleimide, *J.Histochem.Cytochem.*, **28**, 335 (1980).
134. Eisuke SATO, Minoru MACHIDA, and Yuichi KANAOKA, Fluorescence Reagents as an Analytical Tool for Studies of Thio-nucleosides. Their Reactions with Thiouridines, *Chem.Pharm.Bull.*, **28**, 1722-1729 (1980).
135. Minoru MACHIDA, Haruko TAKECHI, and Yuichi KANAOKA, Photocyclization of *N*-Aminoalkylphthalimides. Syntheses of Multicyclic Fused Hexahydropyrazines and Hexahydro-1,4-diazepines, *Heterocycles*, **14**, 1255-1258 (1980).
136. Masayuki NOZAWA, Kazutaka TANIZAWA, and Yuichi KANAOKA, New Chromogenic and Fluorogenic Substrates for the Determination of Butyrylcholinesterase and Arylesterase Activities, *J.Pharm.Dyn.*, **3**, 321-327 (1980).
137. Toshiyuki FUJIOKA, Kazutaka TANIZAWA, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Inverse Substrates. IX. Amidinophenyl Esters Derived from Amino Acids and Peptides: Synthesis and Properties as Trypsin Substrates, *Chem.Pharm.Bull.*, **28**, 1899-1905 (1980).
138. Michiharu NAKANO, Kazutaka TANIZAWA, Masayuki NOZAWA, and Yuichi KANAOKA, Efficient Tryptic Hydrolysis of Aryl Esters with a Cationic Center in the Leaving Group. Further Characterization of "Inverse Substrates", *Chem.Pharm.Bull.*, **28**, 2212-2216 (1980).
139. Yuichi KANAOKA and Kunio SAN-NOHE, Photocyclization of Benzofurancarboxanilides. Photorearrangement of the Benzodihydrofuran System to 3-*O*-Hydroxyphenylquinolones, *Tetrahedron Lett.*, **21**, 3893-3896 (1980).
140. Yuichi KANAOKA, Chemical Studies of Biological Macromolecular Systems by the Design and Application of Functional Organic Molecules, *Yakugaku Zasshi*, **100**, 973-993 (1980) (in Japanese).
141. Hitoshi NAKAYAMA, Kazutaka TANIZAWA, Yuichi KANAOKA, and Bernhard WITKOP, A Novel Chiral Microenvironmental Probe at the Active Site of Trypsin: Extrinsic

Cotton Effects of Acyl-trypsin Possessing an Enantiomeric Pair of Chromophores, *Eur.J.Biochem.*, **112**, 403-409 (1980).

142. Minoru MACHIDA, Haruko TAKECHI, Akiyo SAKUSHIMA, and Yuichi KANAOKA, Photochemistry of the Semicyclic Imide System. I. Evidence for Competitive Type I and Type II Processes, *Heterocycles*, **15**, 479-480 (1981).
143. Masanao TERASHIMA, Kohichi SEKI, Chihiro YOSHIDA, and Yuichi KANAOKA, Photo-Arylation. II. Photoreaction of Halopyridines with Benzene, *Heterocycles*, **15**, 1075-1078 (1981).
144. Toshiyuki FUJIOKA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Analysis of Latent Properties of Trypsin: Acyl Trypsins Derived from Enantiomeric Pairs of "Inverse Substrates", *J.Biochem.*, **89**, 637-643 (1981).
145. Masaaki SUZUKI, Takashi UENO, Tetsuo TAKAHASHI, Yuichi KANAOKA, Teruaki OKUYAMA, Hiroshi FURUYA, and Takamitsu SEKINE, A New Fluorometric Ultramicro Determination of Serum Cystine Aminopeptidase Using an Aminocoumarine Derivative, *Clin.Chem.Acta*, **115**, 223-228 (1981).
146. Masayuki NOZAWA, Kazutaka TANIZAWA, Yuichi KANAOKA, and Hiroshi MORIYA, Behavior of Trypsin and Related Enzymes Toward Amidinophenyl Esters, *J.Pharm.Dyn.*, **4**, 559-564 (1981).
147. Takamitsu SEKINE, Hideko ITAKURA, Toshihiko NAMIHISA, Tetsuo TAKAHASHI, Hitoshi NAKAYAMA, and Yuichi KANAOKA, A Novel Fluorometric Ultramicro Determination of Serum  $\gamma$ -Glutamyl Transpeptidase Activity, *Chem.Pharm.Bull.*, **29**, 3286-3289 (1981).
148. Toshiyuki FUJIOKA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Inverse Substrates. XV. Spectrometric Properties of Fluorescence-labeled Acyl Trypsin, *Chem.Pharm.Bull.*, **30**, 230-236 (1982).
149. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Syntheses of Spiro-Nitrogen Multicyclic Systems by Photocyclization of *N*-Cycloalkenylphthalimides, *Heterocycles*, **17**, 425-428 (1982).
150. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Synthesis of Spiro-Nitrogen Multicyclic Systems Containing Macrocycles by Photocyclization of *N*-( $\omega$ -Inden-3-ylalkyl)phthalimides, *Heterocycles*, **18**, 211-212 (1982).
151. Kazutaka TANIZAWA, Hitoshi NAKAYAMA, Toshiyuki FUJIOKA, Masayuki NOZAWA, Michiharu NAKANO, and Yuichi KANAOKA, Inverse Substrates: Novel Synthetic Substrates for Trypsin and Related Enzymes, *Folia Haematologica*, **109**, 61 (1982).
152. Hideo NAKAI, Yasuhiko SATO, Tomishige MIZOGUCHI, and Yuichi KANAOKA, Preparation of *N*-Benzoylamines by Photodecarboxylation of *N*-Benzoyl- $\alpha$ -amino Acids, *Synthesis*, 141-143 (1982).
153. Masako NAKAGAWA, Masakazu SATO, Yasuji WATANABE, Yasumaru HATANAKA, and Yuichi KANAOKA, 3-Hydroperoxy-3-methyl-2-phenyl-3*H*-indole. Thermal Decomposition and Chemiluminescence, *Heterocycles*, **19**, 503-506 (1982).

154. Yasuhiko SATO, Hideo NAKAI, Tomishige MIZOGUCHI, Masazumi KAWANISHI, Yasumaru HATANAKA, and Yuichi KANAOKA, Photodecarboxylation of *N*-Phthaloyl- $\alpha$ -amino Acids, *Chem.Pharm.Bull.*, **30**, 1263-1270 (1982).
155. Yuichi KANAOKA, Tetsuo TAKAHASHI, Hitoshi NAKAYAMA, Takashi UENO, and Takamitsu SEKINE, Synthesis of a New Fluorogenic Substrate for Cystine Aminopeptidase, *Chem.Pharm.Bull.*, **30**, 1485-1487 (1982).
156. Masayuki NOZAWA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Comparative Studies on the Structure of Active Sites. Behavior of "Inverse Substrates" Toward Trypsin and Related Enzymes, *J.Biochem.*, **91**, 1837-1843 (1982).
157. Masanao TERASHIMA, Masako ISHII, and Yuichi KANAOKA, A Facile Synthesis of 2-Substituted Benzoxazoles, *Synthesis*, 484-485 (1982).
158. Minoru MACHIDA, Haruko TAKECHI, and Yuichi KANAOKA, Photocyclization of  $\omega$ -Anilinoalkylphthalimides: A Photochemical Macrocyclic Synthesis, *Chem.Pharm.Bull.*, **30**, 1579-1589 (1982).
159. Yasuhiko SATO, Hideo NAKAI, Masao WADA, Hiroshi OGIWARA, Tomishige MIZOGUCHI, Yoshihiro MIGITA, Yasumaru HATANAKA, and Yuichi KANAOKA, Photocyclization of *N*-Alkoxyalkylphthalimides with Favored  $\gamma$ -Hydrogen Abstraction: Syntheses of Oxazolo[4,3-*a*]isoindoles and Oxazolo[4,3-*a*]isoindole-1-spiro-1-cycloalkane Ring Systems, *Chem.Pharm.Bull.*, **30**, 1639-1645 (1982).
160. Kazutaka TANIZAWA, Michiharu NAKANO, William B. LAWSON, and Yuichi KANAOKA, Essential Roles of Alkylammonium and Alkylguanidinium Ions in Trypsin-catalyzed Hydrolysis of Acetylglycine Esters: Enhancement of Catalytic Efficiency Analyzed by the Use of "Inverse Substrates", *J.Biochem.*, **92**, 945-951 (1982).
161. Masao WADA, Hideo NAKAI, Yasuhiko SATO, and Yuichi KANAOKA, A Synthetic Approach to Crown Ether Analogs by the Remote Photocyclization with a Pair System of Phthalimide and Methylthio Groups, *Tetrahedron Lett.*, **23**, 3077-3080 (1982).
162. Masao WADA, Hideo NAKAI, Keiichi AOE, Keishi KOTERA, Yasuhiko SATO, and Yuichi KANAOKA, A Synthetic Approach to Macrolide Models by the Remote Photocyclization with a Pair System of Phthalimide and Methylthio Groups, *Chem.Pharm.Bull.*, **30**, 2775-2778 (1982).
163. Masao WADA, Hideo NAKAI, Yasuhiko SATO, and Yuichi KANAOKA, A Removable Functional Group in a Photochemical Macrocyclic Synthesis: Remote Photocyclization with a Pair System of Phthalimide and 1,3-Dithiolanyl Groups, 3414-3417 (1982).
164. Minoru MACHIDA, Sumiko OYADOMARI, Haruko TAKECHI, Kosei OHNO, and Yuichi KANAOKA, Photocyclization of Succinimide Derivatives with Amido Group in Side Chains. Synthesis of Tricyclic Pyrrolo[1,2-*a*]pyrazine Ring Systems, *Heterocycles*, **19**, 2057-2060 (1982).
165. Yuichi KANAOKA, Yasumaru HATANAKA, Eileen N. DEUSLER, Isabella L. KARLE, and Bernhard WITKOP, Photo-Dearomatization. 1,2-Photoaddition of Alcohol to *N*,3-Dimethylphthalimide without Photoenolization, *Chem.Pharm.Bull.*, **30**, 3028-3031 (1982).

166. Eisuke SATO, Yuichi KANAOKA, and Albert PADWA, Intramolecular Photocycloaddition Reactions in the 2-(4-Pentenyl)-5-aryl-Substituted Some Tetrazole System, *J.Org.Chem.*, **47**, 4256-4260 (1982).
167. Minoru MACHIDA, Haruko TAKECHI, Yoko SHISHIDO, and Yuichi KANAOKA, Photochemical Synthesis of Multicyclic Fused Heterocycles. Imidazolidines, Hydropyrazines, and Hydro-1,4-diazepines, *Synthesis*, 1078-1080 (1982).
168. Minoru MACHIDA, Haruko TAKECHI, and Yuichi KANAOKA, Photoreaction of *N*-( $\omega$ -Indol-3-ylalkyl)phthalimides: Intramolecular Oxetane Formation of the Aromatic Imide System, *Tetrahedron Lett.*, **23**, 4981-4982 (1982).
169. Masao WADA, Hideo NAKAI, Yasuhiko SATO, Yasumaru HATANAKA, and Yuichi KANAOKA, Application of the Remote Photocyclization with a Pair System of Phthalimide and Methylthio Groups. A Photochemical Synthesis of Crown Ether Analogs, *Chem.Pharm.Bull.*, **31**, 429-435 (1983).
170. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photolysis of the 2-Azabicyclo[4.1.0]heptane-3,5-diene System, *Chem.Pharm.Bull.*, **31**, 1362-1365 (1983).
171. Masao WADA, Hideo NAKAI, Keiichi AOE, Keishi KOTERA, Yasuhiko SATO, Yasumaru HATANAKA, and Yuichi KANAOKA, Application of the Remote Photocyclization with a Pair System of Phthalimide and Methylthio Groups. A Photochemical Synthesis of Macrolide Models, *Tetrahedron*, **39**, 2691-2698 (1983).
172. Masao WADA, Hideo NAKAI, Yasuhiko SATO, Yasumaru HATANAKA, and Yuichi KANAOKA, A Removable Functional Group in a Photochemical Macrocyclic Synthesis. Remote Photocyclization with a Pair System of Phthalimide and 1,3-Dithiolanyl Groups, *Tetrahedron*, **39**, 2691-2698 (1983).
173. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Effect of 3- and 4-Methyl Substituents on the Photocyclization of *N*-(3-Alkenyl)phthalimides: Synthesis of Pyrroloisoindoles and Pyridoisoindoles, *Chem.Pharm.Bull.*, **32**, 75-84 (1984).
174. Eisuke SATO, Makiko MIYAKAWA, and Yuichi KANAOKA, A Potentially Useful Fluorogenic Amine. 4-Amino-7-nitrobenz-2-oxa-1,3-diazole. An Application as a Substrate for a Microdetermination of Chymotrypsin, *Chem.Pharm.Bull.*, **32**, 336-339 (1984).
175. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Photochemistry of Succinimides with a Cycloalkenylalkyl Group in the Side Chain. Competitive Norrish Type II and Paterno-Büchi Reactions, *Chem.Pharm.Bull.*, **32**, 950-956 (1984).
176. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Photocycloaddition of Arylcarbothioamides with Unsaturated Systems. Synthesis of 3,5-Diaryl-1,2,4-thiadiazoles and 3-Aryl-4,4,5,5-tetramethylisothiazolines *via* Photogenerated Nitrile Sulfides, *Tetrahedron Lett.*, **25**, 409-410 (1984).
177. Toshiyuki FUJIOKA, Tohru MATSUNAGA, Hitoshi NAKAYAMA, Yuichi KANAOKA, Yujiro HAYASHI, Kenji KANGAWA, and Hisayuki MATSUO, A Photoaffinity Reagent to Label the Opiate Receptors of Guinea Pig Ileum and Mouse Vas Deferences, *J.Med.Chem.*, **27**, 836-840 (1984).

178. Takashi UENO, Setsuko HIKITA, Daisaku MUNO, Eisuke SATO, Yuichi KANAOKA, and Takamitsu SEKINE, New Fluorogenic, Photoactivable, Heterobifunctional Crosslinking Thiol Reagents, *Anal.Biochem.*, **140**, 63-68 (1984).
179. Yuichi KANAOKA, Akihiko KOBAYASHI, Eisuke SATO, Hitoshi NAKAYAMA, Takeshi UENO, Daisaku MUNO, and Takamitsu SEKINE, Multifunctional Cross-linking Reagents. I. Synthesis and Properties of Novel Photoactivable, Thiol-directed Fluorescent Reagents, *Chem.Pharm.Bull.*, **32**, 3926-3933 (1984).
180. Koh-ichi SEKI, Kazue OHKURA, Masanao TERASHIMA, and Yuichi KANAOKA, Photo-Arylation III: Synthesis of 2-Heteroarylpyridines, *Heterocycles*, **22**, 2347-2350 (1984).
181. Kazutaka TANIZAWA and Yuichi KANAOKA, Predominant Transesterification Reaction Catalyzed by Immobilized Trypsin, *Chem.Pharm.Bull.*, **32**, 4514-4517 (1984).
182. Masaharu NODA, Shin SHIMIZU, Tsutomu TANABE, Toshiyuki TAKAI, Toshiaki KAYANO, Takayuki IKEDA, Hideo TAKAHASHI, Hitoshi NAKAYAMA, Yuichi KANAOKA, Naoto MINAMINO, Kenji KANGAWA, Hisayuki, MATSUO, Michael A. LAFTERY, Tadaaki HIROSE, Seiichi INAYAMA, Hidenori HAYASHIDA, Takahashi MIYATA, and Shosaku NUMA, Primary Structure of Electrophorus Electricus Sodium Channel Deduced from cDNA Sequence, *Nature*, **312**, 121-127 (1984).
183. Kazutaka TANIZAWA and Yuichi KANAOKA, Oxygen, and Sulfur Esters of "Inverse Substrates", Different Responses of Amidinophenol and Amidinothiophenol in the Activation of the Rate of Tryptic Hydrolysis of the Inverse Esters, *J.Biochem.*, **97**, 275-278 (1985).
184. Masanao TERASHIMA, Koh-ichi SEKI, Chihiro YOSHIDA, Kazue OHKURA, and Yuichi KANAOKA, Photo-Arylation. IV. Synthesis of 2-Arylpyridines by Photo-Reaction of 2-Iodopyridine with Substituted Benzenes, *Chem.Pharm.Bull.*, **33**, 1009-1015 (1985).
185. Yuichi KANAOKA, Tetsuo TAKAHASHI, Hitoshi NAKAYAMA, and Kazutaka TANIZAWA, New Fluorogenic Substrates for Subtilisin, *Chem.Pharm.Bull.*, **33**, 1721-1724 (1985).
186. Minoru MACHIDA, Kazuaki ODA, Eiichi YOSHIDA, and Yuichi KANAOKA, Photochemistry of the Thioimide Systems: Imide-Thietanes, *J.Org.Chem.*, **50**, 1681-1687 (1985).
187. Yasuhiko SATO, Hideo NAKAI, Masao WADA, Tomishige MIZOGUCHI, Yasumaru HATANAKA, Yoshihiro MIGITA, and Yuichi KANAOKA, Photochemistry of the Phthalimide System, 37, Thiazacycloalkanols by Photocyclization of S-Substituted N-(Thioalkyl)phthalimides, *Liebigs. Ann.Chem.*, **6**, 1099-1118 (1985).
188. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Synthesis of Spiro-Nitrogen Multicyclic Systems, Photocyclization of N-[ $\omega$ -(Cycloalken-1-yl)alkyl]- and N-[ $\omega$ -(Inden-3-yl)alkyl]-phthalimides, *Tetrahedron*, **41**, 4995-5001 (1985).
189. Yuichi KANAOKA, Yasumaru HATANAKA, Eileen N. Duesler, Isabella L. KARLE, and Bernhard WITKOP: Photo-Deaomatization of N-Methylphthalimides. An Example of Nucleophilic Aromatic Photoaddition of Alcohol, *Tetrahedron*, **41**, 5365-5370 (1985).

190. Eisuke SATO and Yuichi KANAOKA, Photolysis of *N,N*-Dimethylimidazolidine-trione: A Two Nitrogens-Three Carbonyls System, *Chem.Pharm.Bull.*, **33**, 3006-3008 (1985).
191. Haruko TAKECHI, Minoru MACHIDA, and Yuichi KANAOKA, Intermolecular Photoaddition of *N*-Methylphthalimide to Indole Derivatives: Regio- and Stereo-selective Formation of Oxeto[2,3-*b*]indoles, *Heterocycles*, **23**, 1373-1376 (1985).
192. Minoru MACHIDA, Kazuaki ODA, Eiichi YOSHIDA, Shuji WAKAO, Kosei OHNO, and Yuichi KANAOKA, Photocycloadditions of *N*-Methylmonothiophthalimide with Styrene Derivatives Accompanied by 1,2-Dithiane Formation, *Heterocycles*, **23**, 1615-1618 (1985).
193. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, Intramolecular Photocycloaddition of Thienosuccinimides with Alkenyl-Side Chains: Syntheses of Strained Multicyclic Spiro-thietanes, *Chem.Pharm.Bull.*, **33**, 3552-3554 (1985).
194. Yuichi KANAOKA, Yasumaru HATANAKA, and Haruo OKAJIMA, Organic Photochemical Synthesis, Tetrahydro-azepine-2,5-dione, *J.Photochem.*, **28**, 569-570 (1985).
195. Yuichi KANAOKA, Koichi KOYAMA, and Yasumaru HATANAKA, Organic Photochemical Synthesis, 11-Methyl-6*H*-isoindolo[2,1-*a*]indol-6-one, *J.Photochem.*, **28**, 575-576 (1985).
196. Minoru MACHIDA, Kazuaki ODA, and Yuichi KANAOKA, The Norrish Type II Reaction of The Cyclic Thioimides With a Benzylic Hydrogen, *Tetrahedron Lett.*, **26**, 5173-5174 (1985).
197. Kazutaka TANIZAWA, Yuichi KANAOKA, J. David WOS, and William B. LAWSON, Transition-State Inhibition of Thrombin and Trypsin by Amidinophenylpyruvates, *Biol.Chem.Hoppe-Seyler*, **366**, 871-878 (1985).
198. Kazutaka TANIZAWA, Ashley B. McLAREN, William B. LAWSON, and Yuichi KANAOKA, Comparative Studies on the Stability of Acyl Enzyme Intermediates: An Approach to the Design of Temporary Inhibitors for Trypsin-like Enzymes, *Chem.Pharm.Bull.*, **34**, 913-916 (1986).
199. Koh-ichi SEKI, Kazue OHKURA, Masanao TERASHIMA, and Yuichi KANAOKA, Photoreaction of 4-Iodopyridine with Heteroaromatics, *Heterocycles*, **24**, 799-803 (1986).
200. Kazuaki ODA, Minoru MACHIDA and Yuichi KANAOKA, Intermolecular Photocycloaddition of Ring-substituted Cyclic Dithioimides with 2,3-Dimethyl-2-butene: A Facile Synthesis of Spiro-thietanes, *Synth.Org.Chem.*, **9**, 768-770 (1986).
201. Haruko TAKECHI, Minoru MACHIDA, and Yuichi KANAOKA, Photochemistry of  $\omega$ -Phthalimidoalkanoic Acid Derivatives. Syntheses of Multicyclic Fused Hydropyrazines and 1,4-Diazepines, *Liebigs Ann.Chem.*, 859-868 (1986).
202. Kazuaki ODA, Minoru MACHIDA, Keiichi AOE, Yoshihiko NISHIBATA, Yasuhiko SATO, and Yuichi KANAOKA, Intramolecular Photocycloaddition of 3-Substituted Dithiosuccinimides: Facile Synthesis and The Crystal Structure of Highly Strained Multicyclic Fused Thietane System, *Chem.Pharm.Bull.*, **34**, 1411-1414 (1986).



203. Minoru MACHIDA, Kazuaki ODA, Eiichi YOSHIDA, and Yuichi KANAOKA, Photoreaction of *N*-Substituted Monothiophthalimides with Styrene Derivatives. An Example of Formation and Fission of the Thietane Ring, *Tetrahedron*, **42**, 4691-4699 (1986).
204. Haruko TAKECHI, Sumiko TATEUCHI (nee OYADOMARI), Minoru MACHIDA, Yoshihiko NISHIBATA, Keiichi AOE, Yasuhiko SATO, and Yuichi KANAOKA, Photoreactions of Succinimides with an *N*-Acyl Group in the Side Chain. Synthesis and Stereochemistry of Tricyclic Pyrrolo[1,2-*a*]pyrazine Ring Systems, *Chem.Pharm.Bull.*, **34**, 3142-3152 (1986).
205. Kazutaka TANIZAWA, Kunio OKUMURA, Yasumaru HATANAKA, and Yuichi KANAOKA, Synthesis of Macrobicyclic Peptides, *Heterocycles*, **24**, 1849-1852 (1986).
206. Hitoshi NAKAYAMA, Eiichi YOSHIDA, and Yuichi KANAOKA, The Photoaffinity Labeling with a Tetrodotoxin Derivative of a Sodium Channel Protein from the Electric Eel, *Chem.Pharm.Bull.*, **34**, 2684-2686 (1986).
207. Eisuke SATO, Masato HASEBE, and Yuichi KANAOKA, Photochemistry of Conjugated Nitrogen-Thiocarbonyl Systems. III. Photoaddition of Olefins to 3(2*H*)-Pyridazinethiones, *Chem.Pharm.Bull.*, **34**, 3061-3063 (1986).
208. Kazutaka TANIZAWA, Kunio OKUMURA, Hiromi ITOH, Yasumaru HATANAKA, and Yuichi KANAOKA, Synthesis and Physicochemical Properties of Cyclic Peptides, *Chem.Pharm.Bull.*, **34**, 4001-4011 (1986).
209. Kazuaki ODA, Minoru MACHIDA, and Yuichi KANAOKA, Intramolecular Photocyclization of 3-Substituted Alicyclic Dithioimides: Facile Synthesis of 2-Azabicycloalkanes *via* The Norrish Type II Process, *Chem.Pharm.Bull.*, **34**, 4406-4409 (1986).
210. Kazuaki ODA, Minoru MACHIDA, Keiichi AOE, Yasuhiko SATO, and Yuichi KANAOKA, Photoreaction of *N*-2-Alkenylthiophthalimides: 1,4-Dithiane Formation by Intra- and Inter-molecular Two-fold Photoreactions and The X-Ray Analysis of The Dithianes, *Chem.Pharm.Bull.*, **34**, 4414-4417 (1986).
211. Hitoshi NAKAYAMA, Hiroyoshi SHIKANO, Tomoko AOYAMA, Takehiko AMANO, and Yuichi KANAOKA, Affinity Purification of the Opioid Receptor in NG108-15 Cells Using an Avidin-Biotin System with a Novel Elution Method. *FEBS Lett.*, **208**, 278-282 (1986).
212. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photosensitized Oxygenation of 2-Pyridones, *Heterocycles*, **25**, 65-68 (1987).
213. Kunio OKUMURA, Yasumaru HATANAKA, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Photoaffinity Labeling of a  $\delta$ -Receptor Component of NG108-15 Cells with a New Enkephalin Analog, *Chem.Pharm.Bull.*, **35**, 256-261 (1987).
214. Kazutaka TANIZAWA, Michiharu NAKANO, and Yuichi KANAOKA, Topographical Analysis of Trypsin Active Site Structure by Means of the "Inverse Substrate", *Bioorg.Chem.*, **15**, 50-58 (1987).
215. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photochemistry of Conjugated Nitrogen-carbonyl Systems. III. Photosensitized Oxygenation of 3- and 6-Substituted 2-Pyridones, *Chem.Pharm.Bull.*, **35**, 507-513 (1987)

216. Minoru MACHIDA, Kazuaki ODA, Eiichi YOSHIDA, and Yuichi KANAOKA, Photoreactions of Phthalimide-thietanes: Fission of the Thietane Ring and Formation of 1,2-Dithianes, *Heterocycles*, **26**, 147-156 (1987).
217. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photoaddition of Olefins to Quinolin-, Isoquinolin-, and Phthalazin-thione Systems, *Chemistry Lett.*, 273-276 (1987).
218. Masaharu TAMAI, Chihiro YOKOO, Mitsuo MURATA, Kiyoshi OGUMA, Method for Ethyl(+)-(2S,3S)-3-[(s)-3-Methyl-1-(3-methylbutylcarbonyl)butylcarbonyl]-2-oxiranecarboxylate (EST), A New Inhibitor of Cysteine Proteinases, *Chem.Pharm.Bull.*, **35**, 1908-1104 (1987).
219. Kazutaka TANIZAWA, Michiharu NAKANO, and Yuichi KANAOKA, Comparison of *Streptomyces griseus* and Bovine Trypsin by Active Site Analysis Using Fluorescent Acyl Groups, *Biochim.Biophys.Acta*, **913**, 292-299 (1987).
220. Eisuke SATO, Yoshiya IKEDA, Haruo OKAJIMA, and Yuichi KANAOKA, Photoisomerization of 4-*t*-Butyl-2-pyridones and Chemical and the Hexan-3-one Systems, *Heterocycles*, **26**, 1611-1618 (1987).
221. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photochemistry of Conjugated Nitrogen-Thiocarbonyl Systems. V. Two-fold Photoaddition of Vinyl Ethers to Aza-Aromatic Yhiones, *Chem.Pharm.Bull.*, **35**, 3641-3646 (1987).
222. Robert B. BATES, Vinayak V. KANE, Arnold R. MARTIN, Ratnakar B. MUJUMDAR, Richard ORTEGA, Yasumaru HATANAKA, Kunio SAN-NOHE, and Yuichi KANAOKA, Photochemistry of the Amide System: Furancarboxanilide, *J.Org.Chem.*, **52**, 3178-3180 (1987).
223. Minoru MACHIDA, Mayumi NAKAMURA (nee KITAMURA), Kazuaki ODA, Haruko TAKECHI, Kosei OHNO, Hideo NAKAI, Yasuhiko SATO, and Yuichi KANAOKA, Photoreaction of Phthalimides Possessing an Ortho-Methylphenyl Group in Their N-Side Chain. Synthesis of Tetracyclic Nitrogen Heterocycles, *Heterocycles*, **26**, 2683-2690 (1987).
224. Kazutaka TANIZAWA, Yuichi KANAOKA, and W. B. LAWSON, Inverse Substrates for Trypsin and Trypsin-like Enzymes, *Acc.Chem.Res.*, **20**, 337-343 (1987).
225. Koh-ichi SEKI, Kazue OHKURA, Masanao TERASHIMA, and Yuichi KANAOKA, Synthesis of 1-(2-Pyridyl)indoles by the Photoreaction of 2-Fluoropyridine with Indoles, *Heterocycles* **26**, 3101-3104 (1987).
226. Hiroyuki YAMADA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Differentiation of Tryptic Enzymes Based on Enantiomeric Specificity at the Deacylation Step, *FEBS Lett.*, **227**, 195-197 (1988).
227. Koh-ichi SEKI, Kazue OHKURA, Masanao TERASHIMA, and Yuichi KANAOKA, Photo-Arylation.VII. Photoreaction of 2-Halopyridine with Indole, *Chem.Pharm.Bull.*, **36**, 940-944 (1988).
228. Haruko TAKECHI, Minoru MACHIDA, and Yuichi KANAOKA, Intramolecular Photoreactions of Phthalimide-Alkene Systems. Oxetane Formation of *N*-( $\omega$ -Indol-3-ylalkyl)-phthalimides, *Chem.Pharm.Bull.*, **36**, 2853-2863 (1988).

229. Eisuke SATO, Masato HASEBE, and Yuichi KANAOKA, Photochemistry of 3,4-Diazabicyclo[4.2.0]oct-4-en-2-one System, *Heterocycles*, **27**, 1665-1670 (1988).
230. Eisuke SATO, Masato HASEBE, Tamami NISHIO, Yoshiya IKEDA and Yuichi KANAOKA: Photoaddition of 2-Thiopyridone and 2-Thiopyrimidone to Olefins, *Liebigs Ann.Chem.*, 733-735 (1988).
231. Eisuke SATO, Akira MATSUHISA, Mari SAKASHITA, and Yuichi KANAOKA, New Water-soluble Fluorogenic Amine. 7-Aminocoumarin-4-methanesulfonic Acid (ACMS) and Related Substrates for Proteinases, *Chem.Pharm.Bull.*, **36**, 3496-3502 (1988).
232. Eisuke SATO, Mari SAKASHITA, Yuichi KANAOKA, and Edward M. KOSOWER, Organic Fluorescent Reagents. XIV. Novel Fluorogenic Substrates for Microdetermination of Chymotrypsin and Aminopeptidase: Bimane Fluorescence Appears After Hydrolysis, *Bioorg.Chem.*, **16**, 298-306 (1988).
233. Haruko TAKECHI, Minoru MACHIDA, and Yuichi KANAOKA, Intermolecular Photoreactions of Phthalimide-Alkene Systems. Regio- and Stereo-selective Oxetane Formation from *N*-Methylphthalimide and *N*-Acetylindole Derivatives, *Chem.Pharm.Bull.*, **36**, 3770-3779 (1988).
234. Eisuke SATO and Yuichi KANAOKA, New Fluorogenic Substrates for Microdetermination of Carboxypeptidase A, *Chem.Pharm.Bull.*, **36**, 4494-4498 (1988).
235. Koh-ichi SEKI, Kazue OHKURA, Kohki MATSUDA, Masanao TERASHIMA, and Yuichi KANAOKA, Photo-arylation. VIII. Photosubstitution Reaction of 2-Fluoropyridine with Indoles, *Chem.Pharm.Bull.*, **36**, 4693-4699 (1988).
236. Eisuke SATO, Reiko TODOROKI, Yuichi KANAOKA, Judith L. FLIPPEN, Isabella L. KARLE, and Bernhard. WITKOP, Photodimerization of 2,4-Dioxotetrahydropyridines, *Liebigs Ann.Chem.*, 979-981 (1988).
237. Kazuaki ODA, Minoru MACHIDA, and Yuichi KANAOKA, Photochemistry of the *N*-Acyllactam and Acyclic Thioimide Systems. Competition between Paterno-Büchi Type and Norrish Type I Reactions, *Heterocycles*, **27**, 2417-2422 (1988).
238. Eisuke SATO, Yoshiya IKEDA, Masato HASEBE, Tamami NISHIO, Toyoko MIURA, and Yuichi KANAOKA, Photochemistry of Conjugated Nitrogen-thiocarbonyl Systems. VI. Photoaddition of *Chem.Pharm.Bull.*, **36**, 4749-4754 (1988).
239. Eisuke SATO, Satoko NISHIKAWA, and Yuichi KANAOKA, Novel Fluorogenic Substrates Containing Bimane System for Microdetermination of Angiotensin I Converting Enzyme, *Chem.Pharm.Bull.*, **37**, 145-147 (1989).
240. Kazuaki ODA, Eiichi YOSHIDA, Kosei OHNO, Minoru MACHIDA, and Yuichi KANAOKA, The Norrish Type II Reaction of Thiophthalimides Having a Benzylic Hydrogen in an *N*-Alkyl Side Chain, *Chem.Pharm.Bull.*, **37**, 642-647 (1989).
241. Kazutaka TANIZAWA, Keiko SANTOH, and Yuichi KANAOKA, Diketene Analogs as  $\beta$ -Lactamase Inhibitor, *Chem.Pharm.Bull.*, **37**, 824-825 (1989).
242. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photoaddition of 2-Pyridones to Conjugated Dienes, *Heterocycles*, **28**, 117-120 (1989).

243. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photoaddition of 2-Pyridones and 2-Quinolones to Conjugated Dienes, *Liebigs Ann.Chem.*, 781-788 (1989).
244. Haruko TAKECHI, Minoru MACHIDA, and Yuichi KANAOKA, Photoreactions of Thiobarbiturates with Olefins; Thietane Formation by Intermolecular Photocycloaddition, *Chem.Pharm.Bull.*, **37**, 1431-1433 (1989).
245. Katsuhiko MORIYA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Schiff Base Copper(II) Chelate as a Tool for Intermolecular Cross-linking and Immobilization of Protein, *Biochem.Biophys.Res.Comm.*, **161**, 52-58 (1989).
246. Kazutaka TANIZAWA, Keiko SANTOH and Yuichi KANAOKA, N-Nitroso- $\beta$ -lactams as  $\beta$ -Lactamase Inhibitor, *FEBS Lett.*, **250**, 218-220 (1989).
247. Katsuhiko MORIYA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Immobilized Chymotrypsin by Means of Schiff Base Copper(II) Chelate, *Biochem.Biophys.Res.Comm.*, **162**, 408-414 (1989).
248. Kazue OHKURA, Koh-ichi SEKI, Masanao TERASHIMA, and Yuichi KANAOKA, The Pyridyl Cation as a Reactive Intermediate in the Photoreaction of Iodopyridines with Benzenes, *Tetrahedron Lett.*, **30**, 3433-3436 (1989).
249. Katsuhiko MORIYA, Kazutaka TANIZAWA, and Yuichi KANAOKA, Schiff Base Copper(II) Chelate as a Tool for Immobilization of Protein, *Chem.Pharm.Bull.*, **37**, 2849-2851 (1989).
250. Yasumaru HATANAKA, Eiichi YOSHIDA, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Chromogenic Diazirine: A New Spectrophotometric Approach for Photoaffinity Labeling, *Bioorg.Chem.*, **17**, 482-485 (1989).
251. Kazuaki ODA, Minoru MACHIDA, and Yuichi KANAOKA, Photoreaction of Arenecarbothioamides with Furans. The Regioselective Photoinduced Acylation at the 3-Position of Furans, *Tetrahedron Lett.*, **30**, 4421-4422 (1989).
252. Yasumaru HATANAKA, Eiichi YOSHIDA, Hitoshi NAKAYAMA, T. ABE, Mei SATAKE, and Yuichi KANAOKA, Photolabile  $\mu$ -Conotoxins with a Chromogenic Phenyl diazine. A Novel Probe for Muscle-type Sodium Channels, *FEBS Lett.*, **260**, 27-30 (1990).
253. Yasumaru HATANAKA, Eiichi YOSHIDA, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Synthesis of  $\mu$ -Conotoxin GIIIA: A Chemical Probe for Sodium Channels, *Chem.Pharm.Bull.*, **38**, 236-238 (1990).
254. Kazutaka TANIZAWA, Tsutomu MANO, and Yuichi KANAOKA, Preparation of Fluorescence-labeled and Cross-linked Subtilisin, *Chem.Pharm.Bull.*, **38**, 464-466 (1990).
255. Eiichi YOSHIDA, Hitoshi NAKAYAMA, Yasumaru HATANAKA, and Yuichi KANAOKA, Photoaffinity Labeling of the Electrophilic Sodium Channel with Tetrodotoxin Derivatives. II. Comparison of the Photoreactivity of Different Photoactivable Groups in the Tetrodotoxin Binding Site, *Chem.Pharm.Bull.*, **38**, 982-987 (1990).
256. Kazue OHKURA, Koh-ichi SEKI, Masanao TERASHIMA, and Yuichi KANAOKA, Synthesis of Heteroarylquinolines by the Photolysis of 2-, 3-, and 4-Iodoquinolines, *Heterocycles*, **30**, 957-962 (1990).

257. Kazuaki ODA, Minoru MACHIDA, and Yuichi KANAOKA, Photoreaction of Benzenecarbothioamide with Olefins. Syntheses of Isothiazole Derivatives and Phenones, *Heterocycles*, **30**, 983-991 (1990).
258. Eisuke SATO, Yoshiya IKEDA, and Yuichi KANAOKA, Photochemistry of Conjugated Nitrogen-thiocarbonyl Systems. VII. Photoaddition of Quinoline-, Isoquinoline- and Phthalazine-thione Systems to Olefins, *Chem.Pharm.Bull.*, **38**, 1205-1210 (1990).
259. Eisuke SATO, Kohki MATSUDA, and Yuichi KANAOKA, New Fluorogenic Substrates for Microdetermination of Cathepsin C, *Chem.Pharm.Bull.*, **38**, 2043-2044 (1990).
260. Eisuke SATO, Michi YOSHIKAWA, and Yuichi KANAOKA, Novel Fluorogenic Substrates for Phosphodiesterase I, *Chem.Pharm.Bull.*, **38**, 2287-2289 (1990).
261. Eisuke SATO, Yuichi KANAOKA, and Koichi KIMURA, Heterocycles Related to Nucleotides. X. Reaction of Thiouridine with 2-Chloromercurio-4-nitrophenol, *J.Pharm.Dyn.* **13**, 483-486 (1990).
262. Eisuke SATO, Atsuko SUZUKI, Yuichi KANAOKA, and Koichi KIMURA, Heterocycles Related to Nucleotides. XI. An Organomercurial Column Chromatography for Thiouridine, *J.Pharm.Dyn.*, **13**, 487-492 (1990).
263. Kazutaka TANIZAWA, Sinya WATANABE, and Yuichi KANAOKA, Fluorescence-Labeled Streptomyces Subtilisin Inhibitor: Analysis of the Interaction with Subtilisin and *Streptomyces griseus* Proteases, *Bioorg.Chem.*, **18**, 318-329 (1990).
264. Kazutaka TANIZAWA, Katsuhiko MORIYA, and Yuichi KANAOKA, Dansylation of Streptomyces Subtilisin Inhibitor: Spectrometric Analysis of the Fluorescence-Labeled Inhibitor, *Chem.Pharm.Bull.*, **38**, 2606-2609 (1990).
265. Kazue OHKURA, Koh-ichi SEKI, Masanao TERASHIMA, and Yuichi KANAOKA, Photo and Thermally Induced Reaction of 3- and 4-Fluoropyridines with the Indole 1-Anion, *Heterocycles*, **31**, 1833-1836 (1990).
266. Kazutaka TANIZAWA, Takashi MIYAURA, and Yuichi KANAOKA, Introduction of  $\gamma$ -Glutamyl Residue into Chymotrypsin and Agarose Gel: Application to Cross-Linking and Immobilization of Protein, *Chem.Pharm.Bull.*, **38**, 2868-2870 (1990).
267. Eisuke SATO, Sumiko ITOH, and Yuichi KANAOKA, New Fluorogenic Substrates Containing Bimane System for Ribonuclease T1, *J.Pharm.Dyn.*, **14**, 43-46 (1991).
268. Motohiko TAKI, Akihiko KUNIIYASU, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Synthesis of Diazipine and [<sup>3</sup>H] Diazipine: Novel Dihydropyridines as Photoaffinity Probes of Calcium Channels, *Chem.Pharm.Bull.*, **39**, 1860-1862 (1991).
269. Motohiko TAKI, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Diazipine, a Novel Photoaffinity Probe For Dihydropyridine Receptors of Calcium Channels, *FEBS Lett.*, **283**, 259-262 (1991).
270. Eisuke SATO, Hiromi HATTORI, Satoko NISHIKAWA, and Yuichi KANAOKA, Bimane Fluorogenic Substrates for Microdetermination of Angiotensin Converting Enzyme Level in Serum, *Chem.Pharm.Bull.*, **39**, 2146-2148 (1991).

271. Kenta KAJIWARA, Takashi KUMAZAKI, Eisuke SATO, Yuichi KANAOKA, and Shin-ichi ISHII, Application of Bimane-Peptide Substrates to Spectrofluorometric Assays of Metalloendopeptidases, *J.Biochem.*, **110**, 345-349 (1991).
272. Kazutaka TANIZAWA, Hiroyuki YAMADA, Kunihiko ITOH, and Yuichi KANAOKA, Comparison of Deacylation Rates of Chymotryptic Catalysis within an Enantiomeric Pair of *p*-Nitrophenyl Esters, *Chem.Pharm.Bull.*, **39**, 2748-2749 (1991).
273. Kazue OHKURA, Koh-ichi SEKI, Masanao TERASHIMA, and Yuichi KANAOKA, Direct Photolysis of Halopyridines in Solutions; Generation of the 2-Pyridyl Cation, *Chem.Pharm.Bull.* **39**, 3168-3169 (1991).
274. Eisuke SATO, Hiromi HATTORI, and Yuichi KANAOKA, Fluorogenic Bimane Substrates with Dabsyl Group for Endopeptidases; Chymotrypsin, Collagenase and Thermolysin, *J.Pharmacobio-Dyn.*, **14**, 599-604 (1991).
275. Hitoshi NAKAYAMA, Motohiko TAKI, Jörg STRIESSNIG, Hartmut GLOSSMANN, William A. CATERALL, and Yuichi KANAOKA, Identification of 1,4-Dihydropyridine Binding Regions within the  $\alpha 1$  Subunit of Skeletal Muscle  $\text{Ca}^{2+}$  Channels by Photoaffinity Labeling with Diazipine, *Proc.Natl.Acad.Sci.USA*, **88**, 9203-9207 (1991).
276. Kazuaki ODA, Minoru MACHIDA, and Yuichi KANAOKA, Photochemistry of *N*-But-3-enyl Thiophthalimides. Intramolecular Thietane Formation, *Chem.Pharm.Bull.*, **40**, 585-587 (1992).
277. Eisuke SATO, Kazuyoshi CHIBA, Motonori HOSHI, and Yuichi KANAOKA, Pyranine Phosphate as a New Fluorogenic Substrate for Acidic and Alkaline Phosphatases, *Chem.Pharm.Bull.*, **40**, 786-788 (1992).
278. Kazutaka TANIZAWA, Akihiro SUGIMURA, and Yuichi KANAOKA, Anhydros subtilisin-catalyzed peptide synthesis, *FEBS Lett.*, **296**, 163-165 (1992).
279. Hitoshi NAKAYAMA, Yasumaru HATANAKA, Eiichi YOSHIDA, Kozo OKA, Mayumi TAKANOHASHI, Yuuka AMANO, and Yuichi KANAOKA, Photolabeled Sites with a Tetrodotoxin Derivative in the Domain III and IV of the Electrophax Sodium Channel, *Biochem.Biophys.Res.Comm.*, **184**, 900-907 (1992).
280. Kazuaki ODA, Minoru MACHIDA, and Yuichi KANAOKA, Photoreaction of Arenecarbothioamides with Styrenes: The Regioselective Photoinduced Acylation at the  $\alpha$ -Position of Styrenes, *Synlett.*, **1992**, 603-604.
281. Yasumaru HATANAKA, Yasuhiko SATO, Hideo NAKAI, Masao WADA, Tomishige MIZOGUCHI, and Yuichi KANAOKA, Regioselective Remote Photocyclization: Examples of a Photochemical Macrocyclic Synthesis with Sulfide-Containing Phthalimides, *Liebigs Ann.Chem.*, **1992**, 1113-1123.
282. Yasumaru HATANAKA, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Photoaffinity Labeling of the Electrophax Sodium Channel with a Photoreactive  $\mu$ -Conotoxin Carrying a Radioactive and Chromogenic Diazirine, *Chem.Pharm.Bull.*, **40**, 2537-2539 (1992).
283. Yasuhiko SATO, Hideo NAKAI, Masao WADA, Tomishige MIZOGUCHI, Yasumaru HATANAKA, and Yuichi KANAOKA, Application of Remote Photocyclization with a

- Pair System of Phthalimide and Methylthio Groups. A Photochemical Synthesis of Cyclic Peptide Models, *Chem.Pharm.Bull.*, **40**, 3174-3180 (1992).
284. Hitoshi NAKAYAMA, Shigeki YAMAMOTO, Yasumaru HATANAKA, Tetsuaki HACHISU, Susumu TSUNASAWA, Fumio SAKIYAMA, and Yuichi KANAOKA, Characterization of Saccharide Moiety in the Electrolax Sodium Channel, *Chem.Pharm.Bull.*, **40**, 3287-3291 (1992).
285. Hitoshi NAKAYAMA, Hiroyoshi SHIKANO, and Yuichi KANAOKA, A Site-directed Antibody that Inhibits Phosphorylation of the Rat-brain Sodium Channel by Cyclic-AMP-dependent Protein Kinase, *Biochim.Biophys.Acta*, **1175**, 67-72 (1992).
286. Yasumaru HATANAKA, Hitishi NAKAYAMA, and Yuichi KANAOKA, An Improved Synthesis of 4-[3-(Trifluoromethyl)-3H-diazirin-3-yl]benzoic Acid for Photoaffinity Labeling, *Heterocycles*, **35**, 997-1004 (1993).
287. Kazuaki ODA, Yuichi FUKUZAWA, Kosei OHNO, Minoru MACHIDA, and Yuichi KANAOKA, Photoreaction of 1- and 3-Aralkyl Alicyclic Thioimides: Facile Syntheses of Various Azabicycloalkanes via Norrish Type II Process, *Heterocycles*, **36**, 71-78 (1993).
288. Kazue OHKURA, Masanao TERASHIMA, Yuichi KANAOKA, and Koh-ichi SEKI, New Aspects of the Aromatic Photosubstitution with Iodopyridines, *Chem.Pharm.Bull.*, **42**, 1920-1924 (1994).
289. Kazutaka TANIZAWA, Yoshihiro ICHIKAWA, Eiko TOYATA, Cisako CHINEN, and Yuichi KANAOKA, Optically Active Compounds Derived from Salicyl Aldehyde and Pyridoxal: Syntheses and Their Chelete Formation Properties in the Interaction with  $\alpha$ -Amino Acid, *Bioorg.Chem.*, **21**, 415-422 (1993).
290. Hitishi NAKAYAMA, Yasumaru HATANAKA, Motohiko TAKI, Eiichi YOSHIDA, and Yuichi KANAOKA, Identification of Ligand-Binding Sites that Form External Mouth of Ion Pore in Calcium and Sodium Channels, *Ann.N.Y.Acad.Sci.*, **707**, 349-351 (1993).
291. Eisuke SATO, Shinobu ARISADA, Haruo OKAJIMA, and Yuichi KANAOKA, Bimane Conjugates of 5-Halogenouridylic Acids as Fluorogenic Substrates for Phosphodiesterase I, *J.Chem.Research(S)*, 390-391 (1994).
292. Kazutaka TANIZAWA, Yosihiko ICHIKAWA, Eiko TOYOTA, Hisako CHINEN, and Yuichi KANAOKA, *Bioorg.Chem.*, **22**, 51-57 (1994).
293. Yasumaru HATANAKA, Makoto HASHIMOTO, Hiroko KURIHARA, Hitishi NAKAYAMA, and Yuichi KANAOKA, A Novel Family of Aromatic Diazirines for Photoaffinity Labeling, *J.Org.Chem.*, **59**, 383-387 (1994).
294. Yasumaru HATANAKA, Makoto HASHIMOTO, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Syntheses of Nitro-Substituted Aryl Diazirines. A Chromogenic Entry of Carbene Precursors for Photoaffinity Labeling, *Chem.Pharm.Bull.*, **42**, 826-831 (1994).
295. Yasumaru HATANAKA, Makoto HASHIMOTO, and Yuichi KANAOKA, A Novel Biotinylated Heterobifunctional Cross-Linking Reagent Bearing an Aromatic Diazirine, *Bioorg.Med.Chem.*, **2**, 1367-1373 (1994).

296. Yasumaru HATANAKA, Makoto HASHIMOTO, Kazuya I.-P. Jwa HIDARI, Yutaka SANAI, Yoshitaka NAGAI, and Yuichi KANAOKA, A Carbene-Generating Biotinylated Lactosylceramide Analog as Novel Photoreactive Substrate for GM3 Synthase, *Bioorg.Med.Chem.Lett.*, **5**, 2859-2864 (1995).
297. Hitoshi NAKAYAMA and Yuichi KANAOKA, Chemical Identification of Binding Sites for Calcium Channel Antagonists, *Heterocycles*, **42**, 901-910 (1996).
298. Yasumaru HATANAKA, Makoto HASHIMOTO, Kazuya I.-P. Jwa HIDARI, Yutaka SANAI, Yoshitaka NAGAI, and Yuichi KANAOKA, Synthesis of a Carbon-Linked CMP-NANA Analog and Its Inhibitory Effects on GM3 and GD3 Synthases, *Heterocycles*, **43**, 531-534 (1996).
299. Yasumaru HATANAKA, Makoto HASHIMOTO, Kazuya I.-P. Jwa HIDARI, Yutaka SANAI, Yasuhiro TEZUKA, Yoshitaka NAGAI, and Yuichi KANAOKA, Synthesis and Characterization of a Carbene-Generating Biotinylated Lactosylceramide Analog as a Novel Chromogenic Photoprobe for GM3 Synthase, *Chem.Pharm.Bull.*, **44**, 1111-1114 (1996).
300. Yasumaru HATANAKA, Hitoshi NAKAYAMA, and Yuichi KANAOKA, Diazirine-Based Photoaffinity Labeling: Chemical Approach to Biological Interfaces, *Reviews on Heteroatom Chem.*, **14**, 213-243 (1996).
301. Yasumaru HATANAKA, Makoto HASHIMOTO, Shoko NISHIHARA, Hisashi NARIMATSU and Yuichi KANAOKA, Synthesis and Characterization of a Carbene-Generating Biotinylated N-Acetylglucosamine for Photoaffinity Labeling of  $\beta$ -1,4-Galactosyltransferase, *Carbohydr.Res.*, **294**, 95-108 (1996).
302. Makoto HASHIMOTO, Yuichi KANAOKA, and Yasumaru HATANAKA, A Versatile Approach for Functionalization of 3-Aryl-3-trifluoromethyldiazirine Photophor, *Heterocycles*, **46**, 119-122 (1997).
303. Yasumaru HATANAKA and Yuichi KANAOKA, Biotinyl Diazirine Photophor: An Approach to High-Resolution Photoaffinity Labeling for Probing Receptor-Ligand Interface, *Heterocycles*, **47**, 625-632 (1998).
304. Yasumaru HATANAKA, Makoto HASHIMOTO, and Yuichi KANAOKA, A Rapid and Efficient Method for Identifying Photoaffinity Biotinylated Sites within Proteins, *J.Am.Chem.Soc.*, **120**, 453-454 (1998).
305. Uwe KEMPIN, Yuichi KANAOKA, and Yasumaru HATANAKA, A New Cleavable Carbene-Generating Reagent with 3-Phenyl-3-trifluoromethyldiazirine Photophore, *Heterocycles*, **49**, 465-468 (1998).

In addition to the above original papers, more than 70 books and reviews appeared in Japanese.