

Original Papers

- (1) Functionalized Crown Ethers as an Approach to the Enzyme Model for the Synthesis of Peptides, S. Sasaki, M. Shionoya, and K. Koga, *J. Am. Chem. Soc.* **1985**, *107*, 3371-3372.
- (2) A New Mg²⁺ Ion Receptor. Macrocyclic Polyamines Bearing an Intraannular Phenolic Group, E. Kimura, Y. Kimura, T. Yatsunami, M. Shionoya, and T. Koike, *J. Am. Chem. Soc.* **1987**, *109*, 6212-6213.
- (3) A New Cyclam with an Appended Imidazole. The First Biomimetic Ligation of Imidazole for Axial π -Interaction with Metal Ions, E. Kimura, M. Shionoya, T. Mita, and Y. Iitaka, *J. Chem. Soc., Chem. Commun.* **1987**, 1712-1714.
- (4) The First Fluorinated Cyclams, E. Kimura, M. Shionoya, M. Okamoto, and H. Nada, *J. Am. Chem. Soc.* **1988**, *110*, 3679-3680.
- (5) The First X-ray Crystal Structures of the Platinum(II)-In and -Out Complexes with Dioxocyclams, E. Kimura, S. Korenari, M. Shionoya, and M. Shiro, *J. Chem. Soc., Chem. Commun.* **1988**, 1166-1168.
- (6) A New Tetradentate (N⁻)₂S₂ Macrocyclic Ligand which is Highly Selective for Platinum(II) and Palladium(II), E. Kimura, Y. Kurogi, S. Wada, and M. Shionoya, *J. Chem. Soc., Chem. Commun.* **1989**, 781-783.
- (7) Mono-, Di-, and Tetrafluorinated Cyclams, M. Shionoya, E. Kimura, and Y. Iitaka, *J. Am. Chem. Soc.* **1990**, *112*, 9237-9245.
- (8) Isolation and Unusual Stability of a New Macrocyclic Polyamine Containing a Phthalimidine, E. Kimura, Y. Yoshiyama, M. Shionoya, and M. Shiro, *J. Org. Chem.* **1990**, *55*, 764-766.
- (9) A Novel Cyclam Appended with 3-Hydroxypyridine, an Ambident Donor Ligand Comprising of a Pyridyl N and a Phenolate O⁻ Donors, E. Kimura, Y. Kotake, T. Koike, M. Shionoya, and M. Shiro, *Inorg. Chem.* **1990**, *29*, 4991-4996.
- (10) A Novel Cyclam-Nickel(II) Complex Appended with a Tris-(2,2'-bipyridine)-Ruthenium(II) Complex (Cyclam = 1,4,8,11-tetraazacyclotetradecane), E. Kimura, S. Wada, M. Shionoya, T. Takahashi, and Y. Iitaka, *J. Chem. Soc., Chem. Commun.* **1990**, 397-398.
- (11) The Proximal Imidazole Effect on Manganese(III)-Cyclam Complex, E. Kimura, M. Shionoya, T. Yamauchi, and M. Shiro, *Chem. Lett.* **1991**, 1217-1220.
- (12) Synthesis, Properties, and Complexation of a New Imidazole-Pendant Macrocyclic 12-Membered Triamine Ligand, E. Kimura, Y. Kurogi, M. Shionoya, and M. Shiro, *Inorg. Chem.* **1991**, *30*, 4524-4530.
- (13) Design of Discriminating Hosts for Noble Metal Ions with Double Functions of Thia and

Amide Donors in Macrocyclic Structures, E. Kimura, Y. Kurogi, T. Tojo, M. Shionoya, and M. Shiro, *J. Am. Chem. Soc.* **1991**, *113*, 4857-4864.

(14) A New Nickel(II) Cyclam (Cyclam = 1,4,8,11-tetraazacyclotetradecane) Complex Covalently Attached to Ru(phen)₃²⁺ (phen) = 1,10-phenanthroline), E. Kimura, X.-H. Bu, M. Shionoya, S. Wada, and S. Maruyama, *Inorg. Chem.* **1992**, *31*, 4542-4545.

(15) A Versatile Macrocyclic [12]aneN₃ for Interconversion of Tetrahedral and Trigonal Bipyramidal Zinc(II) Complexes: Relevance to Four- → Five-Coordinate Geometries of Zinc(II) in Carbonic Anhydrase, E. Kimura, T. Koike, M. Shionoya, and M. Shiro, *Chem. Lett.* **1992**, *21*, 787-790.

(16) The pH-Dependent Coordination Mode of New Bleomycin Synthetic Analogues with Copper(II), Iron(II), and Zinc(II), E. Kimura, H. Kurosaki, Y. Kurogi, M. Shionoya, and M. Shiro, *Inorg. Chem.* **1992**, *31*, 4314-4321.

(17) A Model for Catalytically Active Zinc(II) Ion in Liver Alcohol Dehydrogenase: A Novel "Hydride Transfer" Reaction Catalyzed by Zn^{II}-Macrocyclic Polyamine Complexes, E. Kimura, M. Shionoya, A. Hoshino, T. Ikeda, and Y. Yamada, *J. Am. Chem. Soc.* **1992**, *114*, 10134-10137.

(18) Diprotonated Sapphyrin: A Fluoride Selective Halide Anion Receptor, M. Shionoya, H. Furuta, V. Lynch, A. Harriman, and J. L. Sessler, *J. Am. Chem. Soc.* **1992**, *114*, 5714-5722.

(19) A New Ternary Zinc(II) Complex with [12]aneN₄ (= 1,4,7,10-tetraazacyclododecane) and AZT (= 3'-azido-3'-deoxythymidine). Highly Selective Recognition of Thymidine and Its Related Nucleosides by a Zinc(II) Macrocyclic Tetraamine Complex with Novel Complementary Associations, M. Shionoya, E. Kimura, and M. Shiro, *J. Am. Chem. Soc.* **1993**, *115*, 6730-6737.

(20) Inversion of DNA Helicity Induced by Zinc(II)-Macrocyclic Polyamine Complexes, M. Shionoya, E. Kimura, H. Hayashida, G. Petho, and L. G. Marzilli, *Supramol. Chem.* **1993**, *2*, 173-176.

(21) A New Cyclam with an NH₂-Pendant Donor, 6-Amino-1,4,8,11-tetraazacyclotetradecane and Its Nickel(II) Complexes, E. Kimura, M. Haruta, T. Koike, M. Shionoya, K. Takenouchi, and Y. Iitaka, *Inorg. Chem.* **1993**, *32*, 2779-2784.

(22) Spectroscopic Studies on Heterometallo-Binuclear Complex in which Ru(bpy)₃²⁺ was Covalently Attached to Ni(cyclam)²⁺, X.-H. Bu, Y. Liu, Y. T. Chen, M. Shionoya, and E. Kimura, *Chin. Chem. Lett.* **1993**, *4*(9), 837-840.

(23) The Gold(III)-Cyclam Complexes. X-ray Crystal Structure and a Useful Macrocyclic Effect on Reduction of Gold(III) for Development of New Gold Metal Plating, E. Kimura, Y. Kurogi, T. Koike, M. Shionoya, and Y. Iitaka, *J. Coord. Chem.* **1993**, *28*, 33-49.

- (24) Novel Pendant-Type Macrocyclic Biofunctional Chelating Agents: Carboxymethylamino Derivatives of 2-(4-Nitrobenzyl)-1,4,7,10-tetraazacyclododecane-*N,N',N'',N'''*-tetraacetic Acid and Their Complex Formation with Yttrium(III), K. Takenouchi, M. Tabe, K. Watanabe, A. Hazato, Y. Kato, M. Shionoya, T. Koike, and E. Kimura, *J. Org. Chem.* **1993**, *58*, 6895-6899.
- (25) Anion Binding: A New Direction in Porphyrin-Related Research, J. L. Sessler, M. Cyr, H. Furuta, B. Iverson, V. Kral, T. Mody, T. Morishima, M. Shionoya, K. Schreder, and S. Weghorn, *Pure Appl. Chem.* **1993**, *65*, 393-398.
- (26) Synthesis and Characterization of a Novel Ditopic Ligand and Its Heterometallo-Binuclear Complex, X.-H. Bu, S. R. Zhu, Y. T. Chen, M. Shionoya, and E. Kimura, *Chin. Chem. Lett.* **1993**, *4*(8), 749-752.
- (27) Carboxyester Hydrolysis Promoted by a New Zinc(II) Macrocyclic Triamine Complex with an Alkoxide-Pendant: A Model Study for the Serine Alkoxide Nucleophile in Zinc Enzymes, E. Kimura, I. Nakamura, T. Koike, M. Shionoya, Y. Kodama, T. Ikeda, and M. Shiro, *J. Am. Chem. Soc.* **1994**, *116*, 4764-4771.
- (28) New Series of Multifunctionalized Nickel(II)-Cyclam (Cyclam = 1,4,8,11-tetraazacyclotetradecane) Complexes. Application to the Photoreduction of Carbon Dioxide, E. Kimura, S. Wada, M. Shionoya, and Y. Okazaki, *Inorg. Chem.* **1994**, *33*, 770-778.
- (29) Synthesis and Properties of a Novel Nickel (II) Cyclam (Cyclam = 1,4,8,11-tetraazacyclotetradecane) Complex Covalently Attached to Ru(Bpy)₃ (Bpy = 2,2'-bipyridyl), X.-H. Bu, Y. T. Chen, M. Shionoya, and E. Kimura, *Polyhedron* **1994**, *13*, 325-331.
- (30) Novel "Multipoint" Molecular Recognition of Nucleobases by a New Zinc(II) Complex of Acridine-Pendant Cyclen (Cyclen = 1,4,7,10-tetraazacyclododecane), M. Shionoya, T. Ikeda, E. Kimura, and M. Shiro, *J. Am. Chem. Soc.* **1994**, *116*, 3848-3859.
- (31) Uracil-Targeted Inhibition of Poly(A)-Poly(U) Hybridization by a Zinc(II)-Cyclen Complex, M. Shionoya, M. Sugiyama, and E. Kimura, *J. Chem. Soc., Chem. Commun.* **1994**, 1747-1748.
- (32) Inhibition of Human Immunodeficiency Virus Type 1 (HIV-1) Replication by Macrocyclic Polyamines and Their Metal Complexes, Y. Inouye, T. Kanamori, T. Yoshida, X.-H. Bu, M. Shionoya, T. Koike, and E. Kimura, *Biol. Pharm. Bull.* **1994**, *17*, 243-250.
- (33) Inactivation of Bleomycin by an *N*-acetyltransferase in the Bleomycin-Producing Strain *Streptomyces Verticillus*, M. Sugiyama, T. Kumagai, M. Shionoya, E. Kimura, and J. E. Davies, *FEMS Microbiol. Lett.* **1994**, *121*, 81-86.
- (34) Molecular Recognition of Terephthalic Acids by Supramolecular Self-Assembly of

Acridine-Pendant Zn(II)-Cyclen Complex, E. Kimura, T. Ikeda, M. Shionoya, and M. Shiro, *Angew. Chem. Int. Ed. Engl.* **1995**, *34*, 663-664.

(35) A Zinc(II)-Cyclen Complex Attached to an Anthraquinone Moiety that Acts as a Redox-Active Nucleobase Receptor in Aqueous Solution, J. H. R. Tucker, M. Shionoya, T. Koike, and E. Kimura, *Bull. Chem. Soc. Jpn.* **1995**, *68*, 2465-2469.

(36) Molecular Structure of Chloro-[(2*S*, 5*S*, 8*S*, 11*S*)-2,5,8,11-tetraethyl-1,4,7,10-tetraazacyclododecane]zinc(II) Perchlorate, K. Kobayashi, M. Shionoya, E. Kimura, K. Tsuboyama, and S. Tsuboyama, *Anal. Sci.* **1995**, *11*, 1029-1030.

(37) Dimeric Macrocyclic Polyamines with Potent Inhibitory Activity against Human Immunodeficiency Virus, Y. Inouye, T. Kanamori, M. Sugiyama, T. Yoshida, T. Koike, M. Shionoya, K. Enomoto, K. Suehiro, and E. Kimura, *Antiviral Chem. Chemother.* **1995**, *6*, 337-344.

(38) New 1,4,7,10-Tetraazacyclotridecane-11,13-dione Ligands Appended with Additional Donor(s) 8-Methylquinoline(s): Crystal Structures and Characterization of Their Copper(II) Complexes, X.-H. Bu, D. L. An, Y. T. Chen, M. Shionoya, and E. Kimura, *J. Chem. Soc., Dalton Trans.* **1995**, 2289-2295.

(39) Inversion of DNA Helicity Induced by Zinc(II)-Macrocyclic Polyamine Complexes, G. Petho, M. Shionoya, E. Kimura, H. Hayashida, and L. G. Marzilli, *Magy. Kem. Foly.* **1995**, *101*(6), 248-252.

(40) A New Cyclam with a Triphenylphosphine-Pendant and Its Metal Complexes, E. Kimura, Y. Kodama, M. Shionoya, and T. Koike, *Inorg. Chim. Acta* **1996**, *246*, 151-158.

(41) Differential Contribution of Metal Complexation and Dimerization to the Chemotherapeutic Potential of Bicyclen-Zn^{II}₂ Complex against Human Immunodeficiency Virus, Y. Inouye, T. Kanamori, M. Sugiyama, T. Yoshida, T. Koike, M. Shionoya, H. Fujioka, and E. Kimura, *Biol. Pharm. Bull.* **1996**, *19*(3), 456-458.

(42) Stabilization of Ni(III) Ion by Novel Macrocyclic Dioxotetraamines Bearing Functional Pendant, X.-H. Bu, D. L. An, X. C. Cao, Y. T. Chen, M. Shionoya, and E. Kimura, *Polyhedron* **1996**, *15*, 161-163.

(43) Novel Structure of an Unusual *cis*-Nickel(II) Complex of a New Dioxocyclam bearing 2-Methylfuran Pendants, X.-H. Bu, X. C. Cao, Z. H. Zhang, Z. A. Zhu, Y. T. Chen, M. Shionoya, and E. Kimura, *Polyhedron* **1996**, *15*, 1203-1205.

(44) Synthesis, Crystal Structure, and Properties of the Copper(II) Complex of New Dioxocyclam Appended with Two 8-Methylquinoline as Additional Donor Pendants, X.-H. Bu, D. L. An, Y. T. Chen, M. Shionoya, and E. Kimura, *Inorg. Chim. Acta* **1996**, *249*, 125-130.

- (45) Structure and O₂-Uptake Properties of a Novel Nickel(II) Complex of Pyridyl-Pendant Dioxocyclam (1-(2-Pyridyl)methyl-5,7-dioxo-1,4,8,11-tetraazacyclotetradecane), E. Kimura, M. Sasada, M. Shionoya, T. Koike, H. Kurosaki, and M. Shiro, *J. Bioinorg. Chem.* **1997**, *2*, 74-82.
- (46) Macrocyclic Metal Complexes for Selective Recognition of Nucleic Acid Bases and Manipulation of Gene Expression, E. Kimura, T. Ikeda, and M. Shionoya, *Pure Appl. Chem.* **1997**, *69*, 2187-2195.
- (47) Crystal Structure and Properties of the Nickel(II) Complex of a New Dioxo[13]aneN₄ bearing Quinoline Pendants. Striking Differences with Its Copper Analogue, X.-H. Bu, D. L. An, Z. A. Zhu, Y. T. Chen, M. Shionoya, and E. Kimura, *Polyhedron* **1997**, *16*, 179-185.
- (48) Crystal Structure and Properties of the Copper(II) Complex of a New Dioxocyclam Appended with 8-Methylquinoline as Donor Pendant (Dioxocyclam = 1,4,8,11-tetraazacyclotetradecane-2,4-dione), X.-H. Bu, D. L. An, Y. T. Chen, M. Shionoya, and E. Kimura, *J. Inclusion Phenom.* **1997**, *27*, 245-258.
- (49) Macrocyclic Zinc(II) Complexes for Selective Recognition of Nucleobases in Single- and Double-Stranded Polynucleotides, E. Kimura, T. Ikeda, S. Aoki, and M. Shionoya, *J. Bioinorg. Chem.* **1998**, *3*, 259-267.

Proceedings

- (1) Functionalized Crown Ethers as an Approach to the Enzyme Model for the Synthesis of Peptides
S. Sasaki, M. Shionoya, and K. Koga
Heterocycles **20**, 124-125 (1983).
- (2) Crown Ethers as an Approach to the Enzyme Model for the Synthesis of Peptides
S. Sasaki, M. Shionoya, H. Chaki, and K. Koga
Ann. New York Acad. Sci. **471**, 316-317 (1986).
- (3) The Synthesis of a Novel Macrocyclic Polyamide Tb(III) Complex and the Application of the Fluorescent Characteristics to the Sensor for Nucleic Acid Constituents
M. Shionoya, Y. Hata, T. Koike, and E. Kimura
Kidorui **26**, 124-125 (1995).
- (4) Synthesis and Structure of a Novel Macrocyclic Polyamine Terbium Complex and Its Application as Fluorescent Probe for Nucleic Acids
M. Shionoya, Y. Hata, T. Koike, E. Kimura, K. Kobayashi, and S. Tsuboyama
Kidorui **28**, 24-25 (1996).
- (5) Interaction between Guanine-Rich DNA and Rare Earth Complexes

M. Shionoya, S. Wada, T. Koike, and E. Kimura

Kidorui, **30**, 82-83 (1997).

(6) Metal Complexes Targeting AT-Cluster Domains of Double-Stranded DNA

M. Shionoya, A. Ojida, M. Shiotsuka, M. Tasaka, and K. Tanaka

J. Inorg. Biochem. **67**, 346 (1997).

(7) Metal-Assisted Formation of Artificial Nucleic Acids

A. Hatano, H. Morishita, K. Tanaka, and M. Shionoya

Nucleic Acids, Symp. Ser. **39**, 93-94 (1998).

(8) Double Strands Formation of Artificial DNAs Induced by Metal Complexation

K. Tanaka, H. Cao, and M. Shionoya

Nucleic Acids, Symp. Ser. **39**, 171-172 (1998).

Chapters in Books

(1) New Macrocyclic Polyamines with an Appended Imidazole

E. Kimura, M. Shionoya, and Y. Iitaka

Current Topics in Macrocyclic Chemistry in Japan, Ed. by E. Kimura, p 64-69 (1987).

(2) Macrocyclic Polyamine Complex beyond Metalloenzyme Models

E. Kimura and M. Shionoya

NATO ASI Series Transition Metal Ions in Supramolecular Chemistry, Ed. by L. Fabbrizzi; Kluwer, pp 245-249 (1994).

(3) Zinc Complexes as Targeting Agents for Nucleic Acids

E. Kimura and M. Shionoya

Metal Ions in Biological Systems: Probing of Nucleic Acids by Metal Ion Complexes of Small Molecules, Ed. by H. Sigel and A. Sigel; Marcel Dekker Inc.; New York, Basel, Vol. 33, pp 29-52 (1996).

(4) Advances in Zinc Enzyme Models by Small, Mononuclear Zinc(II) Complexes

E. Kimura, T. Koike, and M. Shionoya

Metal Sites in Proteins and Models, Structure and Bonding, Ed. by H. A. O. Hill, P. Sadler and A. J. Thompson; Springer-Verlag; Berlin, Heidelberg, New York, Vol. 89, pp 1-28 (1997).

日本語総説・著書

(1) ホスト-ゲスト相互作用；塩谷光彦，古賀憲司，*化学総説*，**47**，156-165 (1985).

(2) 酵素活性と金属イオン；木村栄一，塩谷光彦，*化学と教育*，**37**，370-373 (1989).

(3) ブレオマイシン；木村栄一，塩谷光彦，*Organometallic News*，No. 1，2-7 (1991).

- (4) 生体類似機能をもつ大環状ポリアミン類の新展開；塩谷光彦，化学と工業，**45**，300-304 (1992).
- (5) 光増感機能を兼ね備えた大環状ポリアミン金属錯体の合成とその応用；塩谷光彦，錯体化学研究会 *News*，No. 12，3-4 (1992).
- (6) 光活性 Ru(II)錯体と大環状ポリアミンの複合錯体による光合成触媒の創造；木村栄一，塩谷光彦，児玉睦夫，飯高洋一，大倉一郎，坂田忠良，小池透，高橋利和，*Research Projects In Review*，**15**，45-50 (1992).
- (7) 抗エイズ活性をもつ大環状ポリアミン化合物；木村栄一，塩谷光彦，化学，**47**，76-77 (1993).
- (8) 亜鉛酵素モデルと核酸認識；木村栄一，塩谷光彦，油化学，**43**，906-913 (1994).
- (9) オリピック化合物を生んだ超分子化学；塩谷光彦，木村栄一，化学，**50**，60-61 (1995).
- (10) 亜鉛金属酵素とモデル系；木村栄一，塩谷光彦，化学総説（生物無機化学の新展開），No. 24，155-166 (1995).
- (11) 亜鉛錯体と核酸；塩谷光彦，木村栄一，ファルマシア，**31**，598-602 (1995).

新聞・一般科学誌紹介記事など

- (1) 重金属、貴金属などの捕獲がー（平成元年4月21日：科学新聞）
- (2) CO₂固定化で新触媒 - 光エネルギーでCOを生成-（平成3年4月4日：日本工業新聞）
- (3) エイズウイルス増殖抑える新物質 - 広大・テルモが合成-（平成4年9月21日：日本工業新聞）
- (4) DNA二重らせん 金属錯体で”解す”（平成9年5月19日：化学工業日報）
- (5) 期待持てる？理科離れ阻止（平成9年11月27日：毎日新聞）

新聞掲載

- フッ素化大環状ポリアミン（科学新聞、1989年）
- 人工光合成触媒（日本工業新聞、1991年）
- 抗エイズ大環状ポリアミン（日本工業新聞、1992年）