

CURRICULUM VITAE (June, 2024)

Prof. Dr. Nobuyoshi MIYAMOTO



- **Associate Professor** of Department of Life, Environment and Materials Chemistry, Faculty of Engineering, Fukuoka Institute of Technology, Japan
- **Affiliate Member** of the International Institute for Sustainability with Knotted Chiral Meta Matter (SKCM2) funded by World Premier International Research Center Initiative (WPI)
- **Research Director** of Research Center for Materials and Energy Devices, Fukuoka Institute of Technology
- **The Chief Organizer** of West Japan Nanosheet Society

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Overview

Dr. Miyamoto obtained his **Ph. D (Engineering)** from **Waseda University, Japan, in 2004** directed by Professor Kazuyuki Kuroda in the field of inorganic materials chemistry. He worked as a researcher at **Tokyo University of Agriculture and Technology (2001-2003)** and initiated the research of inorganic nanosheet liquid crystals working with Professor Teruyuki Nakato. He then moved to **Japan Atomic Energy Agency (2004-2007)** and engaged in in-situ structural analyses of soft materials by small angle neutron/X-ray scattering in the research team directed by Professor Takeji Hashimoto. In **2007**, he moved to **Fukuoka Institute of Technology, Japan**, and is currently an **Associate Professor** of the institute. He was managing the project research **(2015-2019) as the Research Director of Materials and Energy Device Research Center of Fukuoka Institute of Technology (FIT-ME)** funded by the Strategic Research Foundation Grant-Aided Project for Private University from MEXT, Japan. He has been the Chief Organizer of the West Japan Nanosheet Society since 2012. In **2017-2018**, he was working at **Laboratoire de Physique des Solides, Université Paris Sud (France)**, as a visiting researcher. From **2024**, he is an **Affiliate Member** of the International Institute for Sustainability with Knotted Chiral Meta Matter (SKCM2) funded by World Premier International Research Center Initiative (WPI). His research mainly focuses on the synthesis of advanced functional materials based on the **inorganic nanosheets liquid crystals** and **nanosheet/polymer composites**. The main research fields are inorganic chemistry, colloid chemistry, materials chemistry, and polymer chemistry.

Scientific Biography

2024-present : Affiliate Member of the International Institute for Sustainability with Knotted Chiral Meta Matter (SKCM2) funded by World Premier International Research Center Initiative (WPI)

2017-2018: Visiting Researcher, Laboratoire de Physique des Solides, Université Paris Sud, France

2014-2015: Visiting Associate Professor, Kyushu University, Japan

2010-present : Associate Professor, Fukuoka Institute of Technology, Japan

2009-2010: Research Advisor, National Institute of Materials Science (NIMS), Japan

2007-2014: Lecturer, Fukuoka Institute of Technology

2004-2007: Postdoctoral Researcher, Japan Atomic Energy Agency (JAEA) (Advisor: Takeji Hashimoto, honorary professor of Kyoto University)

2003-2004: Researcher, Core Research for Evolutional Science and Technology (CREST), Japan Science and Technology Agency (JST), (Advisor: Professor Kazuyuki Kuroda at Waseda University)
2001-2003: Researcher, Precursory Research for Embryonic Science and Technology (PRESTO), Japan Science and Technology Agency (JST), (Advisor: Prof. Teruyuki Nakato at Tokyo University of Agriculture and Technology)

Educations

2004: Ph.D. (Engineering), Waseda University, Japan
Dissertation title: Nanoscopic and Macroscopic Organization of Cationic Cyanine Dyes with Inorganic Layered Materials
Advisors: Professor Kazuyuki Kuroda
1999: M.A., Applied Chemistry, Faculty of Science and Engineering, Graduate School of Waseda University, Japan.
1997: B. A., Department of Applied Chemistry, Faculty of Science and Engineering, Waseda University, Japan.

Awards

- (1) Best Paper Award of The Japanese Liquid Crystal Society (**2022**)
- (2) Incentive Award of the Clay Science Society of Japan (**2014**)
- (3) Award for Encouragement of Research in Materials Science, *International Union of Materials Research Societies, International Conference in Asia (IUMRS-ICA 2008)*

Professional Societies

- The Chemical Society of Japan (a regular member)
- The Society of Polymer Science, Japan (a regular member)
- The Japan Liquid Crystal Society (a regular member)
- The Clay Science Society of Japan (a regular member)
- The West-Japan Nanosheet Society (the Chief Organizer)
- The Forum on Low-dimensional Photo-Functional Materials (a working committee member)
- The organizing member of *International Union of Materials Research Societies - International Conference on Electronic Materials 2012 (IUMRS-ICEM2012)*
- The organizing member of *International Union of Materials Research Societies - International Conference in Asia 2014 (IUMRS-ICA2014)*
- The conference chairman and International Scientific Committee of *The 5th International Conference on Nanomechanics and Nanocomposites (ICNN5)*

Personal

- Place of Birth: Miyazaki, Japan (July 1974)
- Nationality: JAPAN
- Sex: Male
- Hobbies: Singing, skiing, drinking wines

Research Areas (keywords)

inorganic layered crystals, inorganic nanosheets, liquid crystals, inorganic-organic nanocomposites, clay mineral, polymer gels and rubbers, structural color, self-assembly, supramolecular chemistry, soft materials, colloids, bottom-up nanotechnology, anisotropic materials, functional materials, small angle X-ray/neutron/light scattering, photofunctional materials, soft actuators, chemical sensors, adsorbents, photocatalyst, energy conversion and storage, molecular robotics

Peer-Reviewed Original Papers

- (1) **Sci. Adv.*, **2024**, *10*, eadk6452, N. Miyamoto, M. Miyoshi, R. Kato, Y. Nakashima, H. Iwano & T. Kato "Monodisperse nanosheet mesophases"
- (2) *Small Methods*, **2023**, 2300353, T. Mikami, R. Kato, Y. Hosokawa, N. Miyamoto & T. Kato "Nanostructure Control in Zinc Oxide Films and Microfibers through Bioinspired Synthesis of Liquid-Crystalline Zinc Hydroxide Carbonate; Formation of Free-Standing Materials in Centimeter-Level Lengths"

- (3) **ACS Omega*, **2022**, 7, 6070–6074, N. Miyamoto & S. Yamamoto "Angular-independent structural colors of clay dispersions"
- (4) **ACS Appl. Polym. Mater.*, **2022**, 4, 4664–4672, T. Inadomi, K. Urayama & N. Miyamoto "Unusual actuation of precisely designable two-layer poly(N-isopropylacrylamide) gel films composited with asymmetrically aligned liquid crystalline nanosheet"
- (5) **Angew. Chem. Int. Ed.*, **2021**, 60, 8466–8471, W. Yang, S. Yamamoto, K. Sueyoshi, T. Inadomi, R. Kato & N. Miyamoto "Perovskite Nanosheet Hydrogels with Mechanochromic Structural Color"
- (6) **Mater. Adv.*, **2021**, 2, 1035–1042, T. Morooka, Y. Ohseido, R. Kato & N. Miyamoto "Structure-regulated tough elastomer of liquid crystalline inorganic nanosheets/polyurethane nanocomposite"
- (7) **Chem. Lett.*, **2021**, 50, 632–635, S. Anraku, Y. Kaneko & N. Miyamoto "Grafting of Fluorescence-Labeled ssDNA onto Inorganic Nanosheets and Detection of a Target DNA"
- (8) *Small*, **2020**, 16, 2001721, D. Kuo, M. Liu, K. R. S. Kumar, K. Hamaguchi, K. P. Gan, T. Sakamoto, T. Ogawa, R. Kato, N. Miyamoto, H. Nada, M. Kimura, M. Henmi, H. Katayama & T. Kato "High Virus Removal by Self-Organized Nanostructured 2D Liquid-Crystalline Smectic Membranes for Water Treatment"
- (9) *PLoS One*, **2020**, 15, e0231352, J. J. Keya, H. Kudoh, A. M. R. Kabir, D. Inoue, N. Miyamoto, T. Tani, A. Kakugo & K. Shikinaka "Radial alignment of microtubules through tubulin polymerization in an evaporating droplet"
- (10) **Key Eng. Mater.*, **2019**, 804, 75–82, Y. Ye, M. Nishi, Y. Wenqi, M. Takinoue & N. Miyamoto "Synthesis of Photocatalytic Niobate Nanosheet/Polymer Composite Microgel Particles through Microfluidic Approach"
- (11) **Langmuir*, **2019**, 35, 14543–14552, T. Nakato, A. Takahashi, S. Terada, S. Yamaguchi, E. Mouri, M. Shintate, S. Yamamoto, Y. Yamauchi & N. Miyamoto "Mesoscopic Architectures Made of Electrically Charged Binary Colloidal Nanosheets in Aqueous System"
- (12) *Key Eng. Mater.*, **2019**, 804, 17–21, H. Kino, A. Kiyota, N. Miyamoto, T. Inadomi, T. Kato & H. Fujioka "Basic Study of Heating Response Measurement for Nanosheet Particle/Polymer Composite Gel Actuator with Anisotropic Contraction"
- (13) *J. Robotics Mechatronics*, **2019**, 31, 647–656, H. Kino, A. Kiyota, T. Inadomi, T. Kato, H. Fujioka & N. Miyamoto "Step Response Characteristics of Anisotropic Gel Actuator Hybridized with Nanosheet Liquid Crystal"
- (14) *J. Organometal. Chem.*, **2019**, 886, 34–39, K. Katsuki, K. Kaneko, K. Kaneko, R. Kato, N. Miyamoto & T. Hanasaki "Design and phase transition behavior of siloxane-based monomeric and dimeric liquid crystals bearing cholesteryl mesogenic groups"
- (15) *Key Eng. Mater.*, **2019**, 804, 11–15, H. Fujioka, J. Sawangphol, S. Anraku, N. Miyamoto, H. Kino & A. Hidaka "Detecting Nanosheet Objects from Noisy CLSM Images Using Deep Learning Approach"
- (16) **Sci. Rep.*, **2018**, 8, 4367, N. Yamguchi, S. Anraku, E. Paineau, C. R. Safinya, P. Davidson, L. J. Michot & N. Miyamoto "Swelling Inhibition of Liquid Crystalline Colloidal Montmorillonite and Beidellite Clays by DNA"
- (17) *Dalton Trans.*, **2018**, 47, 3022–3028, Y. Song, N. Iyi, T. Hoshide, T. C. Ozawa, Y. Ebina, R. Ma, S. Yamamoto, N. Miyamoto & T. Sasaki "Massive hydration-driven swelling of layered perovskite niobate crystals in aqueous solutions of organo-ammonium bases"
- (18) **J. Phys. Chem. B*, **2018**, 122, 2957–2961, M. Shintate, T. Inadomi, S. Yamamoto, Y. Kuboyama, Y. Ohseido, T. Arimura, T. Nakazumi, Y. Hara & N. Miyamoto "Anisotropic self-oscillating reaction in liquid crystalline nanosheets hydrogels"
- (19) *Bull. Ceram. Soc. Jpn.*, **2018**, 53, 324–327, N. Miyamoto "Functional Materials from Inorganic Nanosheet Liquid Crystals (in Japanese)"
- (20) **ACS Omega*, **2018**, 3, 14869–14874, R. Kato, A. Kakugo, K. Shikinaka, Y. Ohseido, A. M. R. Kabir & N. Miyamoto "Liquid Crystalline Colloidal Mixture of Nanosheets and Rods with Dynamically Variable Length"
- (21) *RSC Adv.*, **2017**, 7, 45668–45675, V. Veeramani, M. Sivakumar, S.-M. Chen, R. Madhu, H. R. Alamri, Z. A. Alothman, M. S. A. Hossain, C.-K. Chen, Y. Yamauchi, N. Miyamoto & K. C. W. Wu "Lignocellulosic biomass-derived, graphene sheet-like porous activated carbon for electrochemical supercapacitor and catechin sensing"
- (22) *Electrochimica Acta*, **2017**, 247, 288–295, V. Veeramani, R. Madhu, S.-M. Chen, M. Sivakumar, C.-T. Hung, N. Miyamoto & S.-B. Liu "NiCo₂O₄ -decorated porous carbon nanosheets for high-performance supercapacitors"
- (23) *Ionics*, **2017**, 23, 2193–2200, M. Sivakumar, M. Sakthivel, S.-M. Chen, V. Veeramani, W.-L. Chen, G. Bharath, R. Madhu & N. Miyamoto "A facile low-temperature synthesis of V₂O₅ flakes for electrochemical detection of hydrogen peroxide sensor"
- (24) *Electroanalysis*, **2017**, 29, 280–286, M. Sakthivel, M. Sivakumar, S.-M. Chen, Y.-S. Hou, V. Veeramani, R. Madhu & N. Miyamoto "A Facile Synthesis of Cd(OH)₂-rGO Nanocomposites for the Practical

- (25) *New Journal of Chemistry*, **2017**, *41*, 9602-9606, Y. Ohseido, K. Saruhashi, H. Watanabe & N. Miyamoto "Synthesis of an electronically conductive hydrogel from a hydrogelator and a conducting polymer"
- (26) *RSC Adv.*, **2017**, *7*, 41686-41692, Y. Ohseido, M. Oono, K. Saruhashi, H. Watanabe & N. Miyamoto "Thixotropic stiff hydrogels from a new class of oleoyl-D-glucamine-based low-molecular-weight gelators"
- (27) *R. Soc. Open Sci.*, **2017**, *4*, Y. Ohseido, M. Oono, K. Saruhashi, H. Watanabe & N. Miyamoto "New composite thixotropic hydrogel composed of a polymer hydrogelator and a nanosheet"
- (28) *Proc. Computer Sci.*, **2017**, *105*, 62-67, H. Kino, N. Samrejfuangfoo, K. Tsuda, T. Kato, H. Fujioka & N. Miyamoto "Fundamental Study of Soft Actuator Using Anisotropic Gel Hybridized with Nanosheet Liquid Crystal: Analysis of Heat Characteristics and Length Control"
- (29) *Analytical Methods*, **2016**, *8*, 5906-5910, V. Veeramani, R. Madhu, S.-M. Chen, M. Sivakumar, C.-T. Hung, N. Miyamoto & S.-B. Liu "A facile electrochemical synthesis strategy for Cu₂O (cubes, sheets and flowers) microstructured materials for sensitive detection of 4-nitrophenol"
- (30) *J. Phys. Chem. C*, **2016**, *120*, 17024–17028, M. Sivakumar, R. Madhu, S.-M. Chen, V. Veeramani, A. Manikandan, W. H. Hung, N. Miyamoto & Y.-L. Chueh "Low-Temperature Chemical Synthesis of CoWO₄ Nanospheres for Sensitive Nonenzymatic Glucose Sensor"
- (31) *J. Nanosci. Nanotechnol.*, **2016**, *16*, 9231-9237, K. Shimasaki, T. Yamaki, S.-i. Sawada, A. Hiroki, Y. Maekawa & N. Miyamoto "Synthesis of Anisotropic Poly(N-isopropylacrylamide)/Inorganic-Nanosheets Composite Gels by γ -Radiation-Induced Polymerization and Crosslinking"
- (32) *Chem. Select*, **2016**, *4*, 877 – 878, M. Mukai, J.-H. Do, N. Miyamoto & T. Arimura "A Belousov–Zhabotinsky Oscillator Driven by a Water-Soluble Metalloporphyrin"
- (33) *Phys. Chem. Chem. Phys.*, **2016**, *18*, 16466-16475, R. Madhu, V. Veeramani, S.-M. Chen, P. Veerakumar, S.-B. Liu & N. Miyamoto "Functional porous carbon-ZnO nanocomposites for high-performance biosensors and energy storage applications"
- (34) *Mater. Lett.*, **2016**, *168*, 176-179, Y. Kamachi, B. P. Bastakoti, N. Miyamoto, T. Nakato & Y. Yamauchi "Thermo-Responsive Hydrogels Containing Mesoporous Silica toward Controlled and Sustainable Releases"
- (35) *Chem. Commun.*, **2016**, *52*, 1594 - 1597, R. Guégan, K.-i. Sueyoshi, S. Anraku, S. h. Yamamoto & N. Miyamoto "Sandwich organization of non-ionic surfactant liquid crystalline phases as induced by large inorganic K₄Nb₆O₁₇ nanosheets"
- (36) **Clay Sci.*, **2015**, *19*, 73-77, S. Yamamoto, Y. Ohseido, E. Yamada, K. Sonoda, H. Mita & N. Miyamoto "Cultivation of Cellulose-Producing Bacteria in the Nanosheet Liquid Crystal of Na-fluorohectorite"
- (37) *Chem. Commun.*, **2015**, *51*, 17068-17071, Y. Song, N. Iyi, T. Hoshide, T. C. Ozawa, Y. Ebina, R. Ma, N. Miyamoto & T. Sasaki "Accordion-like swelling of layered perovskite crystals via massive permeation of aqueous solutions into 2D oxide galleries"
- (38) *J. Am. Chem. Soc.*, **2015**, *137*, 11558–11561, C. Li, B. Jiang, N. Miyamoto, J. H. Kim, V. Malgras & Y. Yamauchi "Surfactant-Directed Synthesis of Mesoporous Pd Films with Perpendicular Mesochannels as Efficient Electrocatalysts"
- (39) *Chem. Commun.*, **2015**, *51*, 1230-1233, T. Kimura, M. Shintate & N. Miyamoto "In situ observation of the evaporation-induced self-assembling process of PS-*b*-PEO diblock copolymers for the fabrication of titania films by confocal laser scanning microscopy"
- (40) *Angew. Chem. Int. Ed.*, **2015**, *54*, 4222-4225, B. P. Bastakoti, Y. Li, M. Imura, N. Miyamoto, T. Nakato, T. Sasaki & Y. Yamauchi "Polymeric micelle assembly with inorganic nanosheets for construction of mesoporous architectures with crystallized walls"
- (41) *Eur. J. Inorg. Chem.*, **2014**, *2014*, 2773-2778, N. Suzuki, Y. Kamachi, K. Takai, S. Kiba, T. Kotani, Y. Sakka, N. Miyamoto & Y. Yamauchi "Effective Use of Mesoporous Silica Filler: Comparative Study on Thermal Stability and Transparency of Silicone Rubbers Loaded with Various Kinds of Silica Particles"
- (42) *RSC Adv.*, **2014**, *4*, 44837-44840, Y. Ohseido, M. Oono, K. Saruhashi, H. Watanabe & N. Miyamoto "A new composite thixotropic hydrogel composed of a low-molecular-weight hydrogelator and a nanosheet"
- (43) **Chem. Eur. J.*, **2014**, *20*, 14955-14958, N. Miyamoto, K. Shimasaki, K. Yamamoto, M. Shintate, Y. Kamachi, B. P. Bastakoti, N. Suzuki, R. Motokawa & Y. Yamauchi "Mesoporous Silica as a Topologically Crosslinking Filler for Poly(N-isopropylacrylamide) Hydrogel"
- (44) **Macromol. Rapid Commun.*, **2014**, *35*, 1741-1746, T. Inadomi, S. Ikeda, Y. Okumura, H. Kikuchi & N. Miyamoto "Photo-Induced Anomalous Deformation of Poly(N-Isopropylacrylamide) Gel Hybridized with an Inorganic Nanosheet Liquid Crystal Aligned by Electric Field"
- (45) *J. Am. Chem. Soc.*, **2014**, *136*, 5491–5500, F. Geng, R. Ma, Y. Ebina, Y. Yamauchi, N. Miyamoto & T. Sasaki "Gigantic Swelling of Inorganic Layered Materials: A Bridge to Molecularly Thin Two-Dimensional Nanosheets"

- (46) *Chem. Commun.*, **2014**, 50, 9101-9104, B. P. Bastakoti, Y. Li, N. Miyamoto, H. Abe, J. Ye, P. Srinivasu & Y. Yamauchi "Polymeric Micelle Assembly for Direct Synthesis of Functionalized Mesoporous Silica with Fully Accessible Pt Nanoparticles toward Improved CO Oxidation Reaction"
- (47) **Chem. Commun.*, **2013**, 49, 1082-1084, N. Miyamoto, M. Shintate, M. Ikeda, Y. Hoshida, Y. Yamauchi & M. Annaka "Liquid Crystalline Inorganic Nanosheets for Facile Synthesis of Polymer Hydrogels with Anisotropies in Optical Property, Structure, Swelling/Deswelling, and Ion Transport/Fixation"
- (48) *Nat. Commun.*, **2013**, 4, 1632, F. Geng, R. Ma, A. Nakamura, K. Akatsuka, Y. Ebina, Y. Yamauchi, N. Miyamoto, Y. Tateyama & T. Sasaki "Unusually stable ~100-fold reversible and instantaneous swelling of inorganic layered materials"
- (49) *Small*, **2013**, 9, 1047-1051, H. Ataee-Esfahani, J. Liu, M. Hu, N. Miyamoto, S. Tominaka, K. C. W. Wu & Y. Yamauchi "Mesoporous metallic cells: design of uniformly sized hollow mesoporous Pt-Ru particles with tunable shell thicknesses"
- (50) *J. Nanosci. Nanotechnol.*, **2012**, 12, 4502-4507, M. B. Zakaria, N. Suzuki, K. Shimasaki, N. Miyamoto, Y.-T. Huang & Y. Yamauchi "Synthesis of Mesoporous Titania Nanoparticles with Anatase Frameworks and Investigation of Their Photocatalytic Performance"
- (51) *Phys. Rev. E.*, **2012**, 85, 011403, D. Yamaguchi, N. Miyamoto, T. Fujita, T. Nakato, S. Koizumi, N. Ohta, N. Yagi & T. Hashimoto "Aspect Ratio Dependent Phase Transitions and Concentration Fluctuations in Aqueous Colloidal Dispersions of Charged Plate-Like Particles"
- (52) *Chem. Mater.*, **2012**, 24, 1591-1598, H. Wang, L. Wang, T. Sato, Y. Sakamoto, S. Tominaka, K. Miyasaka, N. Miyamoto, Y. Nemoto, O. Terasaki & Y. Yamauchi "Synthesis of Mesoporous Pt Films with Tunable Pore Sizes from Aqueous Surfactant Solutions"
- (53) *Peptide Science*, **2012**, 347-348, M. Turuyama, H. Kanamaru, N. Miyamoto & H. Mita "Organic-inorganic complex of polylysine and fluorohectorite"
- (54) **Phys. Chem. Chem. Phys.*, **2012**, 14, 3400-3407, N. Suzuki, S. Kiba, Y. Kamachi, N. Miyamoto & Y. Yamauchi "Unusual Reinforcement of Silicone Rubber Compounds Containing Mesoporous Silica Particles as Inorganic Fillers"
- (55) *J. Mater. Chem.*, **2011**, 21, 5338-5344, N. Suzuki, S. Kiba, Y. Kamachi, N. Miyamoto & Y. Yamauchi "Mesoporous Silica as Smart Inorganic Fillers: Preparation of Robust Silicone Rubber with Low Thermal Expansion Property"
- (56) **Bull. Chem. Soc. Jpn.*, **2011**, 84, 812-817, N. Suzuki, X. Jiang, L. Radhakrishnan, K. Takai, K. Shimasaki, Y.-T. Huang, N. Miyamoto & Y. Yamauchi "Hybridization of Photoactive Titania Nanoparticles with Mesoporous Silica Nanoparticles and Investigation of Their Photocatalytic Activity"
- (57) *J. Ceram. Soc. Jpn.*, **2011**, 119, 405-411, N. Suzuki, T. Athar, K. Shimasaki, N. Miyamoto & Y. Yamauchi "Synthesis of Mesoporous Nb₂O₅ with Crystalline Walls and Investigation of Their Photocatalytic Activity"
- (58) **J. Nanosci. Nanotechnol.*, **2011**, 11, 3256-3264, K. Shimasaki, N. Suzuki, N. Miyamoto & Y. Yamauchi "Synthesis of Nanoporous Silica/Titania Nanoparticles Composites by Aerosol-assisted Co-assembly and Investigation of their Enhanced Photocatalytic Properties"
- (59) *Chem. Asian J.*, **2011**, 6, 2936-2939, N. Miyamoto, S. Yamamoto, K. Shimasaki, K. Harada & Y. Yamauchi "Exfoliated Nanosheets of Layered Perovskite KCa₂Nb₃O₁₀ as an Inorganic Liquid Crystal"
- (60) *Chem. Eur. J.*, **2011**, 17, 4005-4011, T. Kimura, Y. Yamauchi & N. Miyamoto "Highly photoactive porous anatase films derived by the deformation of 3-D mesostructures"
- (61) *Macromolecules*, **2010**, 43, 2948-2959, Y. Zhao, N. Miyamoto, S. Koizumi & T. Hashimoto "Combined SANS, SEC, NMR, and UV-Vis Studies of Simultaneous Living Anionic Copolymerization Process in a Concentrated Solution: Elucidation of Building-up Processes of Molecules and Their Self-Assemblies"
- (62) **Chem. Commun.*, **2010**, 46, 4166-4168, N. Miyamoto, H. Iijima, H. Ohkubo & Y. Yamauchi "Liquid crystal phases in the aqueous colloids of size-controlled fluorinated layered clay mineral nanosheets"
- (63) *Macromolecules*, **2009**, 42, 1739-1748, Y. Zhao, H. Tanaka, N. Miyamoto, S. Koizumi & T. Hashimoto "Combined SANS, SEC, NMR, and UV-Vis Spectroscopic Studies of Simultaneous Living Anionic Copolymerization Process: Simultaneous Elucidation of Propagating Living Chains at Three Different Length Scales"
- (64) *J. Phys. Chem. B*, **2009**, 113, 1323-1331, T. Nakato, Y. Yamada & N. Miyamoto "Photoinduced Charge Separation in a Colloidal System of Exfoliated Layered Semiconductor Controlled by Coexisting Aluminosilicate Clay"
- (65) *Chem. Lett.*, **2009**, 38, 916-917, T. Kimura, D. Nakashima & N. Miyamoto "Lamellar Mesostructured Aluminum Organophosphonate with Unique Crystalline Framework"
- (66) *Chem. Asian J.*, **2009**, 4, 1486-1492, T. Kimura, N. Miyamoto, X. Meng, T. Ohji & K. Kato "Rapid Fabrication of Mesoporous Titania Films with Controlled Macroporosity to Improve Photocatalytic Property"

- (67) *J. Appl. Cryst.*, **2007**, *40*, s101–s105, D. Yamaguchi, N. Miyamoto, S. Koizumi, T. Nakato & T. Hashimoto "Hierarchical structure of niobate nanosheets in aqueous solution"
- (68) *Angew. Chem., Int. Ed.*, **2007**, *46*, 4123–4127, N. Miyamoto, Y. Yamada, S. Koizumi & T. Nakato "Extremely Stable Photoinduced Charge Separation in a Colloidal System Composed of Semiconducting Niobate and Clay Nanosheets"
- (69) **J. Colloid Interface Sci.*, **2007**, *313*, 369–373, N. Miyamoto & K. Kuroda "Preparation of porous solids composed of layered niobate walls from colloidal mixtures of niobate nanosheets and polystyrene spheres"
- (70) **J. Appl. Cryst.*, **2007**, *40*, s568–s572, N. Miyamoto, Y. Inoue, S. Koizumi & T. Hashimoto "Living anionic polymerization of methyl methacrylate controlled by metal-free phosphazene catalyst as observed by small-angle neutron scattering, gel-permeation chromatography and UV–visible spectroscopy"
- (71) *Physica B*, **2006**, *385–386*, 742–744, H. Tanaka, K. Yamauchi, H. Hasegawa, N. Miyamoto, S. Koizumi & T. Hashimoto "In-Situ and Real-Time Small-Angle Neutron Scattering Studies of Living Anionic Polymerization Process and Polymerization-Induced Self-Assembly of Block Copolymers"
- (72) *Physica B*, **2006**, *385–386*, 752–755, N. Miyamoto, K. Yamauchi, H. Hasegawa, T. Hashimoto & S. Koizumi "Aggregation behavior of polyisoprene chain ends during living anionic polymerization as investigated by time-resolved small-angle neutron scattering"
- (73) *J. Phys. Chem. B*, **2004**, *108*, 6152–6159, N. Miyamoto & T. Nakato "Liquid crystalline nanosheet colloids with controlled particle size obtained by exfoliating single crystal of layered niobate $K_4Nb_6O_{17}$ "
- (74) *J. Phys. Chem. B*, **2004**, *108*, 4268–4274, N. Miyamoto, K. Kuroda & M. Ogawa "Visible light induced electron transfer and long-lived charge separation in cyanine dye/layered titanate intercalation compounds"
- (75) *J. Mater. Chem.*, **2004**, *14*, 165–170, N. Miyamoto, K. Kuroda & M. Ogawa "Exfoliation and film preparation of a layered titanate, $Na_2Ti_3O_7$, and intercalation of pseudoisocyanine dye"
- (76) *Appl. Clay Sci.*, **2003**, *22*, 179–185, M. Ogawa, T. Ishii, N. Miyamoto & K. Kuroda "Intercalation of a cationic azobenzene into montmorillonite"
- (77) *Langmuir*, **2003**, *19*, 3157–3163, T. Nakato, N. Miyamoto, A. Harada & H. Ushiki "Sol-gel transition of niobium oxide nanosheet colloids: a hierarchical aspect of a novel macroscopic property appears in colloiddally dispersed states of layered niobate $K_4Nb_6O_{17}$ "
- (78) *Langmuir*, **2003**, *19*, 8057–8064, N. Miyamoto & T. Nakato "Liquid crystalline colloidal system obtained by mixing niobate and aluminosilicate nanosheets: a spectroscopic study using a probe dye"
- (79) *J. Mater. Chem.*, **2002**, *12*, 1245–1246, T. Nakato & N. Miyamoto "Sol-gel transition of nanosheet colloids of layered niobate $K_4Nb_6O_{17}$ "
- (80) *Chem. Commun.*, **2002**, 2378–2379, N. Miyamoto, H. Yamamoto, R. Kaito & K. Kuroda "Formation of extraordinarily large nanosheets from $K_4Nb_6O_{17}$ crystals"
- (81) *Adv. Mater.*, **2002**, *14*, 1267–1270, N. Miyamoto & T. Nakato "Liquid crystalline nature of $K_4Nb_6O_{17}$ nanosheet sols and their macroscopic alignment"
- (82) *J. Mater. Chem.*, **2002**, *12*, 3463–3468, R. Kaito, N. Miyamoto, K. Kuroda & M. Ogawa "Intercalation of a cationic phthalocyanines into layered titanates and control of the microstructures"
- (83) *Adv. Mater.*, **2001**, *13*, 1107–1109, M. Ogawa, T. Ishii, N. Miyamoto & K. Kuroda "Photocontrol of the Basal Spacing of Azobenzene-Magadiite Intercalation Compound"
- (84) *J. Am. Chem. Soc.*, **2001**, *123*, 6949–6950, N. Miyamoto, K. Kuroda & M. Ogawa "Uni-Directional Orientation of Cyanine Dye Aggregates on a $K_4Nb_6O_{17}$ Single Crystal : Toward Novel Supramolecular Assemblies with Three-Dimensional Anisotropy"
- (85) *Appl. Clay Sci.*, **2001**, *19*, 39–46, N. Miyamoto, K. Kuroda & M. Ogawa "Intercalation of a cationic cyanine dye into the layered silicate magadiite"
- (86) **Mol. Cryst. Liq. Cryst.*, **2000**, *341*, 259–264, N. Miyamoto, K. Kuroda & M. Ogawa "Aggregation of a Cationic Cyanine Dye Intercalated in the Interlayer Space of a Layered Titanate, $Na_2Ti_3O_7$ "
- (87) **Appl. Clay Sci.*, **2000**, *16*, 161–170, N. Miyamoto, R. Kawai, K. Kuroda & M. Ogawa "Adsorption and aggregation of a cationic cyanine dye on layered clay minerals"

Reviews and books

- (1) *Polymers*, **2024**, *73*, 12–15, N. Miyamoto "Network Polymers Compositated with Liquid Crystalline Nanosheets (in Japanese)"
- (2) *Sci. Ind.*, **2024**, *98*, 27–34, N. Miyamoto "Inorganic/polymer nanohybrid materials based on liquid crystalline inorganic nanosheets (in Japanese)"
- (3) *Ekisho*, **2023**, *27*, 51–55, N. Miyamoto, W. Yang, T. Inadomi & R. Kato "Perovskite Nanosheet Hydrogels with Mechanochromic Structural Color (in Japanese)"
- (4) *Fine Chem.*, **2023**, *52*, 27–35, N. Miyamoto "Liquid Crystalline Nanosheets with Structural Colors (in

Japanese)"

- (5) ***Optical and Electro-Optical Engineering Contact*, 2022, 60, 29-35**, N. Miyamoto "Inorganic nanosheet liquid crystals and structural colors"
- (6) *"Chapter 5: Inorganic Nanosheets as Soft Materials" N. Miyamoto, S. Anraku & M. Shintate *Functionalization of Molecular Architectures – Advances and Applications on Low-Dimensional Compounds* (Ed Kazuhiro Shikanaka), Pan Stanford Publishing, **2019**, 123-157,
- (7) ***Bull. Ceram. Soc. Jpn.*, 2018, 53, 324-327**, N. Miyamoto "Functional Materials from Inorganic Nanosheet Liquid Crystals (in Japanese)"
- (8) "Chapter 13: Inorganic Nanosheet Liquid Crystals (in Japanese)" T. Nakato & N. Miyamoto *CSJ current review*, Kagaku Dojin, **2017**, 133-139,
- (9) *"Chapter 7: Functional Layered Compounds for Nanoarchitectonics" N. Miyamoto & S. Yamamoto *Supramolecular Nanoarchitectonics* Eds Katsuhiko Ariga & Masakazu Aono), Elsevier, **2017**, 173-192,
- (10) *"Chapter 8: Colloidal nanosheets" N. Miyamoto, Y. Ohseido & T. Nakato *Inorganic Nanosheets and Nanosheet-Based Materials* Eds Teruyuki Nakato, Jun Kawamata, & Shinsuke Takagi), Springer Japan, **2017**, 201-260,
- (11) ***Science & Industry*, 2017, 91, 85-95**, N. Miyamoto & R. Kato "Various functions and applications of inorganic nanosheets (in Japanese)"
- (12) ***Ekisho*, 2017, 21, 321-324**, N. Miyamoto "Inorganic Nanosheet Liquid Crystal (in Japanese)"
- (13) ****Kobunshi Ronbunshu*, 2016, 73, 262-280**, N. Miyamoto & S. Yamamoto "Inorganic Nanosheet Liquid Crystals: Self-Assembled Structures in Dispersions of Two-Dimensional Inorganic Polymers (in Japanese)"
- (14) ***Nanosci. Nanotechnol. Lett.*, 2016, 8, 355-359**, V. Malgras, Y. Kamachi, T. Nakato, Y. Yamauchi & N. Miyamoto "Recent Developments in Hybrid Hydrogels Containing Inorganic Nanomaterials"
- (15) ****Israel J. Chem.*, 2012, 52, 881-894**, N. Miyamoto & T. Nakato "Liquid Crystalline Inorganic Nanosheet Colloids Derived From Layered Materials"
- (16) ***Kagaku (Kagaku-Dojin)*, 2011, 66, 70-71**, N. Miyamoto "Nanosheet Liquid Crystal—soft functional materials with anisotropy (in Japanese)"
- (17) "Chapter 12: Liquid crystals and gels of clay colloids (in Japanese)" T. Nakato & N. Miyamoto *Recent Trend of Functional Clay Materials* (Ed Makoto Ogawa), CMC Publishing, Co., Ltd., **2010**, 299-314,
- (18) ****Ekisho*, 2010, 14, 108-117**, T. Nakato & N. Miyamoto "Liquid Crystals of Colloidally Dispersed Inorganic Nanosheets and Their Functions (in Japanese)"
- (19) ***Materials*, 2009, 2, 1734-1761**, T. Nakato & N. Miyamoto "Liquid crystalline behavior and related properties of colloidal systems of inorganic oxide nanosheets"

Patents

- (1) Nobuyoshi MIYAMOTO, Kazuki TANAKA, Japan Patent JP7031833, Feb 28, 2022
- (2) Nobuyoshi MIYAMOTO, Momoka MIYOSHI "Inorganic nanosheet stacks and liquid crystals" Japan Patent JP6910044, Jul 8, 2021
- (3) Nobuyoshi MIYAMOTO, Hiroki ISHII, Yutaka OHSEDO "Composite gels" Japan Patent JP7019148, Feb 4, 2022
- (4) Nobuyoshi MIYAMOTO, Toki MOROOKA, Yutaka OHSEDO "Inorganic nanosheet/polymer composites" Japan Patent JP7006885, Jan 11, 2022
- (5) Nobuyoshi MIYAMOTO, Toshiki FURUKAWA, Yutaka OHSEDO "Inorganic nanosheet/polymer composites" Japan Patent JP6986755, Dec 2, 2021
- (6) Nobuyoshi MIYAMOTO, Shinya YAMAMOTO, Junji MIHARAYA "Inorganic nanosheet dispersion" Japan Patent JP6202498, Sep 8, 2017
- (7) Teruyuki NAKATO, Nobuyoshi MIYAMOTO "Gel of exfoliated layered niobate" Japan Patent JP4068355, Jan 18, 2008

- (8) Teruyuki NAKATO, Nobuyoshi MIYAMOTO "Niobate nanosheet liquid crystals" Japan Patent JP4198427, Oct 10, 2008

Research Grants

- (1) Cooperative Research (Daiichi Kigenso), Nobuyoshi Miyamoto (principal investigator), 1,500,000 JPY (2024.4-2025.3)
- (2) The Research Grant of Mazda Foundation, Nobuyoshi Miyamoto (principal investigator), 1,500,000 JPY (2024.4-2026.3)
- (3) Cooperative Research (Daiichi Kigenso), Nobuyoshi Miyamoto (principal investigator), 1,500,000 JPY (2023.4-2024.3)
- (4) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electro-optic response of liquid crystalline monodisperse titania nanosheet", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2023.4-2024.3)
- (5) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electro-optic response of liquid crystalline monodisperse titania nanosheet", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2022.4-2023.3)
- (6) Cooperative Research (Daiichi Kigenso), Nobuyoshi Miyamoto (principal investigator), 1,500,000 JPY (2022.4-2023.3)
- (7) Program of Start-up incubation from COre Research, Japan Science and Technology Agency (JST-SCORE) "Color-tunable smart window based on nanosheet structural color materials", Nobuyoshi Miyamoto (principal investigator), 6,500,000 JPY (2021.7-2022.3)
- (8) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electro-optic response of liquid crystalline monodisperse titania nanosheet", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2021.4-2022.3)
- (9) Cooperative Research (Daiichi Kigenso), Nobuyoshi Miyamoto (principal investigator), 1,000,000 JPY (2021.4-2022.3)
- (10) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electro-optic response of liquid crystalline monodisperse titania nanosheet", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2020.4-2021.3)
- (11) Cooperative Research (Daiichi Kigenso), Nobuyoshi Miyamoto (principal investigator), 1,000,000 JPY (2020.4-2021.3)
- (12) Grant Program of the Sumitomo Foundation "Novel liquid crystal from columnar superstructure of monodisperse inorganic nanosheets", Nobuyoshi Miyamoto (principal investigator), 1,000,000 JPY (2020.11-2023.11)
- (13) "Innovation inspired by Nature" Research Support Program of Sekisui Chemical "Supramolecular actuator inspired by animal myofibrils: novel self-assembly behavior of mono-disperse inorganic nanosheets with precisely controlled size and morphology ", Nobuyoshi Miyamoto (principal investigator), 2,000,000 JPY (2020.10-2021.9)
- (14) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electro-optic response of liquid crystalline monodisperse titania nanosheet", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2019.4-2020.3)
- (15) Grant-in-Aid for challenging Exploratory Research (#18K19135) from the Ministry of Education, Culture, Sports, Science and Technology, Japan. "Self-driven nanosheets activated by molecular motor", Nobuyoshi Miyamoto (principal investigator), 3,500,000 JPY (2018.4-2021.3)
- (16) Grant-in-Aid for Scientific Research (C) from the Ministry of Education, Culture, Sports, Science and Technology, Japan., Tetsuo Yamaguchi, Nobuyoshi Miyamoto (co-investigator), 3,500,000 JPY (2018.4-2021.3)
- (17) Cooperative Research (LG Japan), Nobuyoshi Miyamoto (principal investigator), 4,000,000 JPY (2017.7-2019.6)
- (18) Grant-in-Aid for International Research from the Ministry of Education, Culture, Sports, Science and Technology, Japan. "Manipulation of inorganic nanosheets by the molecular information of DNA", Nobuyoshi Miyamoto (principal investigator), 11,300,000 JPY (2016.4-2019.3)
- (19) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electric-Field Response of Inorganic Nanosheet Colloids Liquid Crystals based on Landau-de Gennes theory", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 2,050,000 JPY (2016.4-2018.3)

- (20) Strategic Research Foundation Grant-Aided Project for Private University from MEXT, JAPAN) "Development of Revolutionary Energy Devices: Fabrication and Mounting of Dielectric Nanocomposite Materials", Nobuyoshi Miyamoto (principal investigator), 200,000,000 JPY (2015.7-2020.3)
- (21) Grant-in-Aid for Scientific Research (C) from the Ministry of Education, Culture, Sports, Science and Technology, Japan. "Manipulation of inorganic nanosheets by the molecular information of DNA", Nobuyoshi Miyamoto (principal investigator), 3,500,000 JPY (2015.4-2018.3)
- (22) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Development of Optical Devices Based on Liquid Crystalline Inorganic Nanosheets", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 4,000,000 JPY (2015.4-2016.3)
- (23) The Canon Foundation "Development of functional inorganic nanosheet liquid crystals based on layered perovskites", Nobuyoshi Miyamoto (principal investigator), 18,000,000 JPY (2013.4-2016.3)
- (24) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electric-Field Response of Nanosheet Liquid Crystals: The Effects of Solvent Permittivity and Nanosheet Thickness", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2013.4-2014.3)
- (25) Grant-in-Aid for Scientific Research (No. 24104005) on Innovative Areas of "Molecular Robotics" (No. 2403) from the Ministry of Education, Culture, Sports, Science, and Technology, Japan., Nobuyoshi Miyamoto (principal investigator), 300,000,000 JPY (2012.7-2017.3)
- (26) Cooperative Research Program of Network Joint Research Center for Materials and Devices, "Electric-Field Response of Nanosheet Liquid Crystals: The Effects of Solvent Permittivity and Nanosheet Thickness", Nobuyoshi Miyamoto (principal investigator), Yasushi Okumura, 150,000 JPY (2012.4-2013.3)
- (27) Cooperative Research (Asahi Kasei), Nobuyoshi Miyamoto (principal investigator), 2,000,000 JPY (2010.1-2011.12)
- (28) Reimei Research Program of Japan Atomic Energy Agency, "Photofunctions and structural analysis of semiconductor nanosheet colloids by small angle neutron scattering", Nobuyoshi Miyamoto (principal investigator), 6,000,000 JPY (2008-2009)
- (29) Grant-in-Aid for Young Scientists (B) from the Ministry of Education, Culture, Sports, Science and Technology, Japan. "Synthesis of functional materials based on inorganic nanosheet-polymer hybrid with an entropy-driven mesostructures", Nobuyoshi Miyamoto (principal investigator), 3,500,000 JPY (2007.4-2009.3)
- (30) Grant-in-Aid for Young Scientists (B) from the Ministry of Education, Culture, Sports, Science and Technology, Japan. "Design of new living anionic polymerization system by utilizing small-angle neutron scattering", Nobuyoshi Miyamoto (principal investigator), 3,700,000 JPY (2005.4-2007.3)
- (31) Seki Memorial Foundation "Fabrication of functional materials by hybridization of inorganic nanosheet liquid crystals with organic liquid crystals", Nobuyoshi Miyamoto (principal investigator), 800,000 JPY (2010)
- (32) The Kao Foundation for Arts and Sciences, "Responses of Clay Mineral Nanosheet Liquid Crystals to Temperature and Electric Field", Nobuyoshi Miyamoto (principal investigator), 1,000,000 JPY (2010)
- (33) National, Public, and Private Universities' Consortium-Fukuoka, "Development of hybrid gels of inorganic nanosheets liquid crystal and polymers for environmental sensing and cleanup", Nobuyoshi Miyamoto (principal investigator), Masahiko Annaka, 2,000,000 JPY (2009)
- (34) Nippon Sheet Glass Foundation for Materials Science and Engineering "Synthesis of novel liquid crystal materials by exfoliation of layered silicates", Nobuyoshi Miyamoto (principal investigator), 1,000,000 JPY (2008)

Teaching

- Organic Chemistry (2007-2010, 2023-present)
- Polymer Chemistry I (2011-present)
- Nanomaterials Chemistry (2015-present)
- Introduction to the Scientific Experiments (2013-present)
- Seminar for Life, Environment, and Materials Science (2007-present)
- Basic Experiments of Functional Materials Engineering (2007-present)
- Basic Experiments of Chemistry (2007-present)
- Colloid Chemistry (2011-2014)

- Computer Programming (2007-2012)
- Materials Engineering for Environment (2007-2010)
- Special Lecture on Instrumentation for Materials and Environmental Science (2008-**present**)
- Special Lecture on Materials Science (2008-**present**)
- Special Lecture on Scientific English (2011)