

CURRICULUM VITAE

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Date of birth: Sep. 8, 1977

Nationality: Japan

* All years shown below follow the Japanese fiscal year, starting in April and ending in March of the following year.

Education

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| 1996 - 1999 | Undergraduate course at the Department of Quantum Engineering and Systems Science, The University of Tokyo.

Thesis: "Development of the Radiation Measurement by Optical Fiber"

Bachelor of Engineering |
| 2000 - 2001 | Master course at the Department of Quantum Engineering and Systems Science, The University of Tokyo.

Thesis: "Complexation of Uranyl with Humic Substances Studied by Fluorescence Spectroscopy"

Master of Engineering |
| 2002 - 2004 | Doctoral course at the Department of Quantum Engineering and Systems Science, The University of Tokyo.

Studying for one year at the Laboratory of Physical Chemistry and Colloid Science, Wageningen University, the Netherlands. Supervisor: Prof. Luuk K. Koopal. |

Thesis: "Metal Binding to Natural Colloids: Extension from Binary to Ternary Systems"
Doctor of Engineering

Job history

2005	Post-doctoral researcher at Department of Quantum Engineering and Systems Science, School of Engineering, the University of Tokyo.
2006	Research associate at Department of Quantum Engineering and Systems Science, School of Engineering, the University of Tokyo.
2007	Assistant professor at Department of Quantum Engineering and Systems Science, School of Engineering, the University of Tokyo.
2008 - 2012	Assistant professor at Department of Nuclear Engineering and Management, School of Engineering, the University of Tokyo.
2013	Lecturer at Nuclear Professional School, School of Engineering, the University of Tokyo.
2014 - 2015	Researcher, Advance Science Research Center, Japan Atomic Energy Agency.
2015-2022	Associate Professor, Nuclear Professional School, School of Engineering, The University of Tokyo
2022-present	Professor, Nuclear Professional School, School of Engineering, The University of Tokyo

Award

2010.6	Poster Award, IAP (Interface Against Pollution) 2010 conference, Beijing, China Saito, T., "Effects of Humate-surface Interaction on Metal Adsorption: EXAFS study on the Uranyl/Humic acid/Goethite System"
2014.3	Good Presentation Award, Subcommittees of Nuclear Fuel Cycle and Environment, Japan Atomic Energy Agency, 2014.3. Saito, T., Terashima, M., "Ion complexation and chemical structures of deep underground humic substances", Japan Atomic Energy Agency, Spring meeting.

External funding history

2007 - 2009	Grant-in-Aid for Young Scientists (A), Japan Society for the Promotion of Science "Environmental behaviors of radionuclides by dynamic speciation techniques" 23,660,000 JPY (in total)
2010 - 2012	Basic and important technologies for nuclear waste disposal, Radioactive Waste Management Funding and Research Center "Research on natural colloids in groundwater by field-flow fractionation" 9,410,285 JPY (in total)
2010 - 2013	Research on complexation parameters of organic matters, Mitsubishi Materials 7,300,000 JPY (in total)
2013 - 2014	Grant-in-Aid for Young Scientists (B), Japan Society for the Promotion of Science "Structures, metal binding, origin of natural organic matters in deep underground water" 3,300,000 JPY (in total)

2015 - 2018	Grant-in-Aid (B), Japan Society for the Promotion of Science “Sorption and desorption dynamics of cesium by chemical and radiation imaging” 15,770,000 JPY (in total, in FY2015)
2018 - 2020	Grant-in-Aid (B), Japan Society for the Promotion of Science “Variety of natural organic materials in deep underground water and their impacts on radionuclide transport” 13,600,000 JPY (in total)
2018 - 2020	Projects for nuclear science and technology and human resource development, MEXT “Identification of fuel debris alternation by laser fluorescence spectroscopy” 28,982,000 JPY (in total)
2021 - 2023	Grant-in-Aid (B), Japan Society for the Promotion of Science “Understanding barrier performance of Preneogene sedimentary rocks” 13,650,000 JPY (in total)

Research interests

- Chemodynamics and migration of radionuclides in environments including deep groundwater and soils
 - Size and elemental distribution of nano colloids in deep groundwater
 - Chemical dynamics and migration of radionuclides in real contaminated soils
- Modeling of the interaction between metal ions including actinides and radionuclides and natural reactants such as small inorganic and organic ligands, humic substances and mineral surface
- Development of advanced speciation techniques using laser spectroscopy and field-flow fractionation technique
- Ion migration and water dynamics in micro-structures of compacted bentonite

Areas of expertise

Academic fields

- Nuclear engineering, especially, fuel cycle and waste management
- Geochemistry
- Radiochemistry
- Colloid Science
- Physical chemistry

Technical experience

- Spectroscopy: UV/Vis, FTIR including ATR methods, fluorescence.
- Laser spectroscopy: time-resolved laser fluorescence spectroscopy, laser raman spectroscopy, dynamic light scattering.
- X-ray absorption spectroscopy: XANES, EXAFS.
- Powder X-ray diffraction and small-angle X-ray scattering (SAXS).
- Chromatography: ion chromatography, liquid chromatography, field-flow fractionation.
- ICP-MS, AES.

- Electrophoresis for zeta potential measurement.
- Electrochemistry: potentiometric titration, voltammetry (CV, ASV, CSV).
- Radiation detection: HPGe detector, liquid scintillation counter.
- Numerical calculation: MATLAB (more than 10-year experience).
- Statistical analysis: PCA, PLS, factor analysis including multi-mode factor analysis.
- Molecular simulation: molecular orbital calculation with the Gaussian code, density functional theory calculation with the Gaussian and ADF codes.
- Synthesis, purification and handling of humic substances and minerals.
- Handling of field samples (soil and ground water).
- Handling of radioisotopes and actinide elements.

Management and administrative skills

- System administrator in the laboratory and departments: Linux, Windows, Mac.
- Web administrator in the laboratory and department.

Language

- English: Writing and speaking

Teaching experiences

Undergraduate teaching

- “Laser, beam, and plasma: application of energy science to daily life”, College of Arts and Science, The University of Tokyo, 2013 (Japanese).
- “Basics of Safety Science”, Department of Systems Innovation, Faculty of Engineering, The University of Tokyo, 2013 (Japanese).
- “Nuclear Energy Engineering”, Department of Systems Innovation, Faculty of Engineering, The University of Tokyo, 2013 (Japanese).
- Tutor and supervisor of the undergraduate theses in Department of Quantum Engineering and Systems Science and Department of Systems Innovation, Faculty of Engineering, The University of Tokyo, 2003 - present.
- Supervisor of the exercise courses of the Department of Systems Innovation, The University of Tokyo, 2011-2013.

Graduate teaching

- “System Safety”, Department of Nuclear Engineering and Management, School of Engineering, The University of Tokyo, 2013 (English).
- “Chemistry in Nuclear Engineering”, Department of Nuclear Engineering and Management, School of Engineering, The University of Tokyo, 2013 (English).

- “Advanced Lecture on Nuclear Fuel Cycle”, Department of Nuclear Engineering and Management, School of Engineering, The University of Tokyo, 2013 (English).
 - “Introduction to Nuclear Engineering”, Department of Nuclear Engineering and Management, School of Engineering, The University of Tokyo, 2013 (English).
 - “Advanced Radiation Engineering”, Department of Nuclear Engineering and Management, School of Engineering, The University of Tokyo, 2013 (English).
 - “Advanced Modeling E”, Department of Nuclear Engineering and Management, School of Engineering, the University of Tokyo, 2008 (English).
 - “Nuclear Fuel Cycle Engineering”, Nuclear Professional School, School of Engineering, The University of Tokyo, 2010 - 2013 (Japanese).
 - “Nuclear Waste Management”, Nuclear Professional School, School of Engineering, The University of Tokyo, 2013 (Japanese).
 - Co-supervisor of the master and doctor theses of the Department of Quantum Engineering and Systems Science and Department of Nuclear Engineering and Management, School of Engineering, the University of Tokyo, 2003 - present.
- 16 master-course and 3 doctor-course students.

Professional activities

Consulting

- Technical advisory committee, Nuclear Waste Management Organization of Japan (NUMO). Apr 2015 - present
- Review committee for “Implementation of Safe Geological Disposal in Japan”, Nuclear Waste Management Organization of Japan (NUMO). Oct 2010 – Mar 2011
- Advisory committee for “Radionuclides in sea and groundwater due to the Fukushima Daiichi Nuclear Power Plant”, Tokyo Electric Power Company (TEPCO). May 2013 - Feb 2014

Publications

(* Corresponding author)

- (1) Mei, H., Aoyagi, N., Saito, T., Tanaka, K., Sugiura, Y., Tachi, Y., “U(VI) adsorption on mudstone in the presence of carbonate: Batch experiments, modeling, cryo-TRLFS and PARAFAC analysis”, *Appl. Clay Sci.*, 276, 107944 (2025).
- (2) Hou, L., Fukatsu, Y., Okamoto, S., Toda, K., Nakata, K., Nohara, S., Ishidera, T., and Saito, T., “Diffusion of Cs⁺, I⁻ and HDO onto pre-Neogene sedimentary rocks”, *J. Nucl. Sci. Technol.*, in press (2025).
- (3) Toda, K., Lang, L., Saito, T., Endo, K., Yamada, K., Tojo, Y., “Solidification of Cs-bearing melting fly ash by cement and metakaolin-based geopolymers”, *Nucl. Eng. Design* **442**, 114253 (2025).
- (4) Yıldırım, A. C., Huiyang, M., Toda, K., Aoyagi, N., Saito, T., “Sorption mechanism of europium(III) onto metakaolin-based geopolymers”, *Appl. Clay Sci.* **274**, 1078853 (2025).
- (5) Koopal, L. K., Saito, T., Avena, M., “Modified Donnan model for ion binding to small soft nano particles”, *Colloid Surf A.* **705**, 135665 (2025).

- (6) Tanaka, T., Fukuoka, M., Toda, K., Nakanishi, T., Terashima, M., Fujiwara, K., Niwano, Y., Kato, H., Kobayashi, N. I., Tanoi, K., Saito, T.*, "Application of Diffusive Gradients in Thin Films (DGT) for the Dynamic Speciation of Radioactive Cesium in Fukushima Prefecture, Japan", *ES&T Water* **4**, 3579–3586 (2024).
- (7) Sugiura, Y.*, Ishidera, T., Aoyagi, N., Mei, H., Saito, T., Tachi, Y., "Trivalent lanthanide sorption onto illite in the presence of carbonate: A study combining thermodynamic sorption modeling, time-resolved laser fluorescence spectroscopy, and parallel factor analysis", *Appl. Clay Sci.* **258**, 107476 (2024).
- (8) Aoyagi, N.*, Motokawa, R., Okumura, M., Ueda, Y., Saito, T., Nishitsuji, S., Taguchi, T., Yomogida, T., Sazaki, G., Ikeda-Ohno, A., "Globular pattern formation of hierarchical ceria nanoarchitecture", *Comm. Chem.* **7**, 128 (2024).
- (9) Miyazaki, K., Tkehara, M., Minomo, K., Horie, K., Takehara, M., Yamasaki, S., Saito, T., Ohnuki, T., Takano, M., Shiotsu, H., Iwata, H., Vettese, G. F., Sarparanta, M. P., Law, G. T. W., Grambow, B., Ewing, R. C., Utsunomiya, S.*, "Invisible" radioactive cesium atoms revealed: Pollucite inclusion in cesium-rich microparticles (CsMPs) from the Fukushima Daiichi Nuclear Power Plant", *J. Hazard. Mater.* **470**, 134104 (2024).
- (10) Hou, L.*, Toda, K., Mei, H., Aoyagi, N., Saito, T., "Sorption of Cs⁺ and Eu³⁺ onto coherent and melange-type pre-neogene sedimentary rocks", *J. Nucl. Sci. Technol.*, in press (2024).
- (11) Yıldırım, A. C.*, Toda, K., Saito, T., "Determination of the sorption mechanisms of sodium-alkalinized metakaolin-based geopolymers", *Appl. Clay Sci.*, **251**, 107303 (2024).
- (12) Mei, H.*, Aoyagi, N., Saito, T., Tanaka, K., Sugiura, Y., Tachi, Y., "U(VI) sorption on illite in the presence of carbonate studied by cryogenic time-resolved laser fluorescence spectroscopy and parallel factor analysis", *Appl. Geochem.*, **162**, 105926 (2024).
- (13) Saito, T.*, Nishi, S., Amano, Y., Beppu, H., Miyakawa, K., "Origin of dissolved organic matters in deep groundwater of marine deposits and its implication for metal binding", *ES&T Water*, **3**, 4103-4112 (2023).
- (14) Racette, J., Walker, A., Nagasaki, S., Yang, T. T., Saito, T., Vilks, P., "Influence of Ca–Na–Cl Physicochemical Solution Properties on the Adsorption of Se(-II) onto Granite and MX-80 Bentonite to Support the Post-Closure Safety Assessment of a Used Nuclear Repository in Crystalline Rock", *Nucl. Eng. Technol.*, **55**, 3831-3843 (2023).
- (15) Saito, T.*, Motokawa, R., Ohkubo, T., Miura, D., Kumada, T., "Heterogeneous Aggregation of Humic Acids Studied by Small-Angle Neutron and X-ray Scattering", *Environ. Sci. Technol.*, **57**, 9802–9810 (2023).
- (16) Murota, K.*, Takahashi, Y., Saito, T., "Adsorption of cesium and strontium on mesoporous silicas", *Phys. Chem. Chem. Phys.*, **25**, 16135-16147 (2023).
- (17) Murota, K.*, Aoyagi, N., Mei, H., Saito, T., "Hydration states of europium(III) adsorbed on silicas with nano-sized pores", *Appl. Geochem.* **152**, 105620 (2023).
- (18) Wang, Y., Saito, T., Fakhreddine, S., Nagasaki, S., "Mechanisms of Selenate Adsorption at the Imogolite-Water Interface", *Colloid Surf. A* **656**, 130444 (2022).
- (19) Rizaal, M.*, Nakajima, K., Saito, T., Osaka, M., and Okamoto, K., "High-Temperature Gaseous Reaction of Cesium with Siliceous Thermal Insulation: The Potential Implication to the Provenance of Enigmatic Fukushima Cesium-Bearing Material", *ACS Omega* **7**, 29326–29336 (2022).
- (20) Toda, K.*, Minato, D., Saito, T., Kikuchi, R., Otake, T., Sato, T., "Effects of lignosulfonate on synthesis products of the pozzolanic reaction", *Cement* **9**, 100042 (2022).
- (21) Murota, K.*, Saito, T., "Pore size effects on surface charges and interfacial electrostatics of mesoporous silicas", *Phys. Chem. Chem. Phys.* **24**, 18073-18082 (2022).
- (22) Fueda, K., Takami, R., Minomo, K., Morooka, K., Horie, K., Takehara, M., Yamasaki, S., Saito,

- T., Shiotsu, H., Ohnuki, T., Law, G. T. W., Grambow, B., Ewing, R. C., Utsunomiya, S., "Volatilization of B4C control rods in Fukushima Daiichi nuclear reactors during meltdown: B–Li isotopic signatures in cesium-rich microparticles", *J. Haz. Mat.* **428**, 128214 (2022).
- (23) Mei, H., Aoyagi, N., Saito, T., Kozai, N., Sugiura, Y., Tachi, Y., "Uranium (VI) sorption on illite under varying carbonate concentrations: Batch experiments, modeling, and cryogenic time-resolved laser fluorescence spectroscopy study", *Appl. Geochem.* **136**, 105178 (2022).
- (24) Koopal, L. K., Xiong, J., Wenfeng, T., Saito, T., Avena, M., "Proton binding to humic nano particles: Electrostatic interaction and the condensation approximation", *Phys. Chem. Chem. Phys.* **24**, 704-714 (2022).
- (25) Nakano, S.; Marumo, K.; Kazami, R.; Saito, T.; Haraga, T.; Tasaki-Handa, Y.; Saito, S., "Stoichiometry between Humate Unit Molecules and Metal Ions in Supramolecular Assembly Induced by Cu²⁺ and Tb³⁺ Measured by Gel Electrophoresis Techniques. Environ Sci Technol 55, 15172-15180 (2021).
- (26) Zhou, Q.,* Saito, T., Suzuki, S., Yano, K., Suzuki, S., "Microparticles with diverse sizes and morphologies from mechanical and laser cutting of fuel debris simulants and geopolymer as a covering material", *J. Nucl. Sci. Technol.* **58**, 461-472 (2021).
- (27) Murota, K., Tanoi, K., Ochiai, A., Utsunomiya, T., Saito, T., "Desorption mechanisms of cesium from illite and vermiculite", *Appl. Geochem.* **123**, 104768 (2020).
- (28) Saeki, M.*, Yomogida, T., Matsumura, D., Saito, T., Nakanishi, R., Tsuji, T., Ohba, H., "Application of augmentation method to MCR-ALS analysis for XAFS and Raman data matrices in structural change of isopolymolybdates", *Anal. Sci.* **36**, 1371-1378 (2020).
- (29) Rizaal, M., Saito, T., Okamoto, K., Erkan, N., Nakajima, K., Osaka, M., "Room-temperature adsorption behavior of cesium onto calcium silicate insulation", *Mech. Eng. J.* **7**, 19-00563-19-00563 (2020).
- (30) Zhang, X.*, Okamoto, K., Erkan, N., Saito, T., "Experimental study on the effects of fine bubbles on polydisperse submicron aerosol removal efficiency during pool scrubbing", *Mech. Eng. Lett.*, **6**, 19-00655 (2020).
- (31) Rizaal, M.*, Nakajima, K., Saito, T., Osaka, M., Okamoto, K., "Investigation of high temperature chemical interaction of calcium silicate insulation and cesium hydroxide", *J. Nucl. Sci. Technol.* **57**, 1062-1073 (2020).
- (32) McGrady, J.*, Yamashita, S., Kimura, A., Kano, S., Yang, H., Duan, Z, Saito, T., Abe, H., "γ-radiation effects on metal oxide particles and their wetted surfaces", *J. Nucl. Sci. Technol.* **57**, 463-471 (2020).
- (33) Marumo, K., Matsumoto, A., Nakano, S., Shibukawa, M., Saito, T., Haraga, T., Saito, S.*, "Advanced Gel Electrophoresis Techniques Reveal Heterogeneity of Humic Acids Based on Molecular Weight Distributions of Kinetically Inert Cu²⁺–Humate Complexes", *Environ. Sci. Technol.* **53**, 14507-14515 (2019).
- (34) Kato, T.*, Yu, Q., Tanaka, K., Kozai, N., Saito, T., Ohnuki, T., "Reduction behaviors of permanganate by microbial cells and concomitant accumulation of divalent cations of Mg²⁺, Zn²⁺, and Co²⁺", *J. Environ. Sci.* **86**, 78-86 (2019).
- (35) Kobayashi, T., Nakajima, S., Motokawa, R., Matsumura, D., Saito, T., Sasaki, T., "A Structural Approach to Understanding the Solubility of Metal Hydroxides", *Langmuir* **35**, 7795-8006 (2019).
- (36) Kimuro, S.*, Kirishima, A., Nagao, S., Saito, T., Amano, Y., Miyakawa, K., Akiyama, D., Sato, N., "Characterization and thermodynamic study of humic acid in deep groundwater at Horonobe, Hokkaido, Japan", *J. Nucl. Sci. Technol.* **55**, 503-515 (2018).
- (37) Nagasaki, S.*, Riddoch, J., Saito, T., Goguen, J., Walker, A., Yang, T., "Sorption behaviour of Np(IV) on illite, shale and MX-80 in high ionic strength solutions", *J. Radioanal. Nucl. Chem.*

313, 1-11 (2017).

- (38) Saito, T.*, Aoyagi, N., Terashima, M., “Europium binding to humic substances extracted from deep underground sedimentary groundwater studied by time-resolved laser fluorescence spectroscopy”, *J. Nucl. Sci. Technol.* **54**, 444-451 (2017).
- (39) Daryakenari, A. D., Hosseini, D., Ho, Y. L., Saito, T., Apostoluk, A., Mueller, C. R., Delaunay, J. J.*, “Single-Step Electrophoretic Deposition of Non-Noble Metal Catalyst Layer with Low Onset Voltage for Ethanol Electro-oxidation”, *ACS Appl. Mater. Interfaces* **8**, 15975-15984 (2016).
- (40) Fujiwara, T., Mitsuya, Y., Yanagida, T., Saito, T., Toyokawa, H., Takahashi, H., “High-photon-yield scintillation detector with Ar/CF₄ and glass gas electron multiplier”, *Jpn. J. Appl. Phys.* **55**, 106401–106404 (2016).
- (41) Nagasaki, S.*, Saito, T., Yang, T., “Sorption behavior of Np(V) on illite, shale and MX-80 in high ionic strength solutions”, *J. Radioanal. Nucl. Chem.* **308**, 143-153 (2016).
- (42) Sasaki, T*, Ueda, K., Saito, T., Aoyagi, N., Kobayashi, T., Takagi, I., Kimura, T., Tachi, Y., “Sorption of Eu³⁺ on Na-montmorillonite studied by time-resolved laser fluorescence spectroscopy and surface complexation modeling”, *J. Nucl. Sci. Technol.* **53**, 592-601 (2016).
- (43) Murota, K., Saito, T.*, and Tanaka, S., “Desorption kinetics of cesium from Fukushima soils”, *J. Environ. Radioact.* **153**, 134-140 (2016).
- (44) Saito, T.*, Terashima, M., Aoyagi, N., Nagao, S., Fujitake, N., Ohnuki, T., “Physicochemical and ion-binding properties of highly aliphatic humic substances extracted from deep sedimentary groundwater”, *Env. Sci. Process. Impact* **17**, 1386-1395 (2015).
- (45) Yamashita, Y.*, Saito, T., “Effects of weak organic acids on the size distribution and size-dependent metal binding of humic substances as studied by flow field-flow fractionation”, *J. Environ. Chem. Eng.* **3**, 3024-3029 (2015).
- (46) Daryakenari, A. A., Hosseini, D., Saito, T., Apostoluk, A., Muller, C. R., Delaunay, J.-J.*, “Ethanol electro-oxidation on nanoworm-shaped Pd particles supported by nanographitic layers fabricated by electrophoretic deposition”, *RSC Advances* **5**, 52578-52587 (2015).
- (47) Saito, T.*, Hamamoto, T., Mizuno, T., Iwatsuki, T., Tanaka, T., “Comparative study of granitic and sedimentary groundwater colloids by flow field flow fractionation coupled with ICP-MS”, *J. Anal. At. Spectrom.* **30**, 1229-1236 (2015).
- (48) Saito, T.*, Aoyagi, N., Kimura, T., “Time-resolved laser-induced fluorescence spectroscopy combined with parallel factor analysis: a robust speciation technique for UO₂²⁺”, *J. Radioanal. Nucl. Chem.* **303**, 1129-1132 (2015).
- (49) Saito, T.*, Makino, H., Tanaka, S., “Geochemical and grain-size distribution of radioactive and stable cesium in Fukushima soils: implications for their long-term behavior”, *J. Environ. Radioact.* **138**, 11-18 (2014).
- (50) Shimojo, K.*, Nakai, A., Okamura, H., Saito, T., Ohashi, A., Naganawa, H., “Comprehensive Extraction Study using N,N-Dioctyldiglycolamic Acid”, *Anal. Sci.*, **30**, 513-517 (2014).
- (51) Shimojo, K.*, Aoyagi, N., Saito, T., Okamura, H., Kubota, F., Ohashi, A., Naganawa, H., “Highly Efficient Extraction Separation of Lanthanides Using a Diglycolamic Acid Extractant”, *Anal. Sci.* **30**, 263-269 (2014).
- (52) Abdelouas, A. *, El Mendili, Y., Aït Chaou, A., Karakurt, G., Hartnack, C., Bardeau, J., Saito, T., Matsuzaki, H., “A Preliminary Investigation of the ISG Glass Vapor Hydration”, *Int. J. Appl. Glass Sci.* **4**, 307-316 (2013).
- (53) Niida, K.*, Saito, T., Tanaka, S., “Comparison of uranyl adsorption on Fe³⁺ oxyhydroxide colloids”, *Chem. Let.* **42**, 1380-1382 (2013).
- (54) Saito, T.*, Suzuki, Y., Mizuno, T., “Size and elemental analyses of nano colloids in deep granitic groundwater: Implications for transport of trace elements”, *Colloids Surf. A* **435**, 48-55

(2013).

- (55) Tsubaki, H., Saito, T., Murakami, T.*, "Size distribution of ferrihydrite aggregate and its implication for metal adsorption and transport", *J. Miner. Petrol. Sci.* **107**, 244-249 (2012).
- (56) Okamura, H., Ikeda-Ohno, A., Saito, T., Aoyagi, N., Naganawa, H., Hirayama, N., Umetani, S., Imura, H., Shimojo, K.*, "Specific Cooperative Effect of a Macrocyclic Receptor for Metal Ion Transfer into an Ionic Liquid", *Anal. Chem.* **84**, 9332-9339 (2012).
- (57) Miyake, Y.*, Matsuzaki, H., Fujiwara, T., Saito, T., Yamagata, T., Honda, M., Muramatsu, Y., "Isotopic ratio of radioactive iodine ($^{129}\text{I}/^{131}\text{I}$) released from Fukushima Daiichi NPP accident", *Geochem. J.* **46**, 327-333 (2012).
- (58) Sakai, M.*, Shigeto, Y., Sun, X., Aoki, T., Saito, T., Xiong, J., Koshizuka, S., "Lagrangian-Lagrangian modeling for a solid-liquid flow in a cylindrical tank", *Chem. Eng. J.* **200-202**, 663-672 (2012).
- (59) Fujiwara, T.*, Saito, T., Muroya, Y., Sawahata, H., Yamashita, Y., Nagasaki, S., Okamoto, K., Takahashi, H., Uesaka, M., Katsumura, Y. and Tanaka, S., "Isotopic ratio and vertical distribution of radionuclides in soil affected by the accident of Fukushima Dai-ichi nuclear power plants", *J. Environ. Radioact.* **113**, 37-44 (2012).
- (60) Lukman, S., Saito, T.*, Aoyagi, N., Kimura, T., Nagasaki, S., "Speciation of Eu^{3+} Bound to Humic Substances by Time-Resolved Laser Fluorescence Spectroscopy (TRLFS) and Parallel Factor Analysis (PARAFAC)", *Geochim. Cosmochim. Acta* **88**, 199-215 (2012).
- (61) Ishida, K., Saito, T.*, Aoyagi, N., Kimura, T., Nagaishi, R., Nagasaki, S., Tanaka, S., "Surface Speciation of Eu^{3+} Adsorbed on Kaolinite by Time-Resolved Laser Fluorescence Spectroscopy (TRLFS) and Parallel Factor Analysis (PARAFAC)", *J. Colloid Interface Sci.* **374** (1), 258-266 (2012).
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- (64) Saito, T.*, Sao, H., Ishida, K., Aoyagi, N., Kimura, T., Nagasaki, S., Tanaka, S., "Application of Parallel Factor Analysis for Time-Resolved Laser Fluorescence Spectroscopy: Implication for Metal Speciation Study", *Environ. Sci. Technol.* **44**, 5055-5060 (2010).
- (65) Hattori, T.*, Saito, T., Ishida, K., Scheinost, A. C., Tsuneda, T., Nagasaki, S., Tanaka, S., "The Structure of Monomeric and Dimeric Uranyl Adsorption Complexes on Gibbsite: A Combined DFT and EXAFS Study", *Geochim. Cosmochim. Acta* **73**, 5975-5988 (2009).
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- (67) Ishida, K.*, Kimura, T., Saito, T., Tanaka, S., "Adsorption of $\text{Eu}(\text{III})$ on a Heterogeneous Surface Studied by Time-Resolved Laser Fluorescence Microscopy (TRLFM)", *Environ. Sci. Technol.* **43**, 1744-1749 (2009).
- (68) Saito, T.*, Koopal, L. K., Nagasaki, S., Tanaka, S., "Adsorption of Heterogeneously Charged Nanoparticles on a Variably Charged Surface by the Extended Surface Complexation Approach: Charge Regulation, Chemical Heterogeneity and Surface Complexation", *J. Phys. Chem. B* **112**, 1339-1349 (2008).
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- (1) Aoyagi, N., Saito, T., "Luminescence spectroscopy as versatile probes for chemical diagnostics on the solid-liquid interface", in *Laser Surface Engineering. Processes and Applications*, Lawrence J., Waugh D. G. eds., Woodhead publishing, Cambridge, 2014.
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Talks in international conferences

Invited & keynote talk

- (1) Saito, T., "Origin and Ion Binding Properties of Dissolved Organic Matters in Deep Sedimentary Groundwater studied by EEM and FT-ICR-MS", keynote lecture, ISBEC 2023, Tsukuba, Japan, 2023.3.
- (2) Saito, T., Motokawa, R., Kumada, T., "Aggregation structures of humic substances studied by small-angle X-ray and neutron scattering", TGSW2020 (Tsukuba Global Science Week 2020, online, 2020.9.
- (3) Saito, T., "Humic substances in deep sedimentary groundwater", invited talk, Japan Geoscience Union (JpGU) Meeting 2019, Chiba, Japan, 2019.5.
- (4) Saito, T., "Cadmium binding and formation of nano-sized particles with humic acid extracted from deep sedimentary groundwater", Keynote lecture, IAP 2018, La Grande Motte, France, 2018.7.

- (5) Saito, T., "Ion-binding properties of humic substance in deep sedimentary groundwater", Keynote lecture, IAP2016, Lleida, Spain, 2016.9.
- (6) Saito, T., "Application of multi-mode factor analysis as a robust data reduction tool for time-resolved laser fluorescence spectroscopy", invited talk, International Workshop on Advanced Techniques for Actinide Spectroscopy (ATAS 2012), Dresden, Germany, 2012.11.
- (7) Saito, T., "Actinide Adsorption at Solid-Liquid Interfaces: Current Status and Future Challenges", invited talk, PACIFICHEM 2010 (2010 INTERNATIONAL CHEMICAL CONGRESS OF PACIFIC BASIN SOCIETIES), Honolulu, Hawaii, 2010.12.

Oral presentation

- (8) Saito, T., Motokawa, R., Kumada, T., "Hierarchical aggregation of humic nano colloids induced by metal ion binding by small-angle X-ray and neutron scattering", IAP2024, Torino, 2024.9.
- (9) Toda, K., Saito, T., Tojo, Y., "Interfacial reactions affecting the Cs leaching behaviors of adsorbents solidified with cement and geopolymer", IAP2024, Torino, 2024.9.
- (10) Saito, T., Nishi, S., Sato, H., Toda, K., Miyakawa, K., "REVEALING THE ORIGIN AND ION-BINDING PROPERTIES OF DISSOLVED ORGANIC MATTERS IN DEEP SEDIMENTARY GROUNDWATER", Migration 2023, Nantes, 2023.9.
- (11) Mei, H., Aoyagi, N., Saito, T., Sugiura, Y., Ishidera, T., Tanaka, K., Tachi, Y., "U(VI) SORPTION ON ILLITE IN THE PRESENCE OF CARBONATE STUDIED BY CRYOGENIC TIME-RESOLVED LASER FLUORESCENCE SPECTROSCOPY AND PARALLEL FACTOR ANALYSIS: COMPARISON WITH TRIVALENT LANTHANIDES", Migration 2023, Nantes, 2023.9.
- (12) Nishi, N., Toda, K., Saito, T., "Origin and ion binding properties of dissolved organic matters in deep sedimentary groundwater", IAP 2022, Antwerp, 2022.9.
- (13) Murota, K., Saito, T., "Unique sorption of Cs and Sr onto mesoporous silicas", IAP 2022, Antwerp, 2022.09.
- (14) Yildirim, A. C., Toda, K., Aoyagi, N., Saito, T., "Modeling of Cs⁺, Sr²⁺ and Eu³⁺ Sorption to Sodium-Activated Metakaolin-Based Geopolymers", IAP 2022, Antwerp, 2022.9.
- (15) Saito, T., Tanaka, T., Fukuoka, M., "Lability of radioactive cesium in soil and aqueous environments of Fukushima studied by Cs-DGT", PACIFICHEM 2021, online, 2021.12.
- (16) Saito, T., Motokawa, R., Kumada, T., "Hierarchical aggregation structures of humic acid by small-angle X-ray and neutron scattering", IAP 2021, online, 2021.5.
- (17) Kobayashi, T., Nakajima, S., Nishikawa, S., Motokawa, R., Saito, T., Sasaki, T., "Solubility Limiting Solid Phase in Zr(IV)/Th(IV) Hydroxide System under Elevated Temperature: Solubility and SWAXS Study", Migration 2017, Barcelona, Spain, 2017.9.
- (18) Saito, T., "Eu³⁺ binding to deep groundwater humic substances studied by time resolved laser fluorescence spectroscopy and factor analysis", International Workshop on Advanced Techniques for Actinide Spectroscopy (ATAS 2014), Dresden, Germany, 2014.11.
- (19) Sasaki, T., Ueda, K., Saito, T., Aoyagi, N., Kobayashi, T., Takagi, I., Kimura, T., Tachi, Y., "Sorption of Eu³⁺ on montmorillonite studied by time-resolved laser fluorescence spectroscopy and surface complexation modeling", International Workshop on Advanced Techniques for Actinide Spectroscopy (ATAS 2014), Dresden, Germany, 2014.11.
- (20) Saito, T., Aoyagi, N., Kimura, T., "Application of multi-mode factor analysis for time-resolved laser fluorescence spectroscopy to study radionuclide interaction with minerals and natural organic materials", 248th ACS National Meeting, San Francisco, 2014.8.
- (21) Saito, T., Mizuno, T., "Size And Elemental Analyses of Nano-Colloids in Deep Granitic Groundwater: Implications for Transport of Trace Elements", IAP2012, Nancy, France, 2012.6.
- (22) Ishida, K., Kimura, T., Saito, T. and Tanaka, S., "Adsorption of Eu(III) on A Heterogeneous

Surface Studied by Time-Resolved Laser Fluorescence Microscopy (TRLFS)", Migration '09, Kennewich, USA, 2009.9.

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- (24) Takahashi, M., Kawasaki, D., Saito, T., Shimizu, I., Nagasaki, S., Tanaka, S., "Studies on matrix diffusion of colloid in a fractured medium", IAP 2008, Kyoto, Japan, 2008.6.
- (25) Saito, T., Nagasaki, S., Tanaka, S., "Evaluation of the electrostatic potential of a humic acid molecule by a fluorescence quenching technique", IAP 2008, Kyoto, Japan, 2008.6.
- (26) Saito, T., Nagasaki, S., Tanaka, S., Koopal, L. K., "Effects of Humic Acid-Oxide Interaction on Proton and Metal Ion Binding to the Complex of Both Colloids", IAP2006, Granada, Spain, 2006.6.
- (27) Saito, T., Nagasaki, S., Tanaka, S., Koopal, L. K., "Metal Binding to Natural Colloids: Extension from Binary to Ternary Systems", PACIFICHEM 2005 (2005 INTERNATIONAL CHEMICAL CONGRESS OF PACIFIC BASIN SOCIETIES), Honolulu, Hawaii, 2005.12.
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Poster presentation

- (30) Prihutami, P., Chaerun, R. I., Ohya, Y., Toda, K., Saito, T., Kikuchi, R., Otake, T., Sato, T., "X-RAY ABSORPTION SPECTROSCOPY STUDY ON ZINC IMMOBILIZATION IN METAKAOLIN-BASED POTASSIUM-GEOPOLYMER", ECI Alkali Activated Materials and Geopolymers: High-End Technical Applications, Espoo, Finland, 2025.5.
- (31) Viaud, M., Toda, K., Saito, T., "Immobilization of cesium and selenium in fly-ash/slag-based geopolymer matrices", ECI Alkali Activated Materials and Geopolymers: High-End Technical Applications, Espoo, Finland, 2025.5.
- (32) Toda, K., Motokawa, R., Saito, T., "Application of the polydisperse spherical model for pore distribution development of metakaolin-based geopolymers", ECI Alkali Activated Materials and Geopolymers: High-End Technical Applications, Espoo, Finland, 2025.5.
- (33) Sato, H., Toda, K., Beppu, H., Amano, Y., Miyakawa, K., Saito, T., "Molecular characterization of reactive deep underground dissolved organic matters for metal ion using fluorescence spectroscopy and highresolution mass spectrometry", IAP2024, Torino, 2024.9.
- (34) Sugiura, Y., Ishidera, T., Aoyagi, N., Mei, H., Saito, T., Tachi, Y., "TRIVALENT LANTHANIDES SORPTION ONTO ILLITE IN THE PRESENCE OF CARBONATE", Migration 2023, Nantes, 2023.9.
- (35) Hou, L., Toda, K., Saito, T., "METAL IONS ADSORPTION AND MODELING ON A PRENEOGENESEDIMENTARY ROCK", Migration 2023, Nantes, 2023.9.
- (36) Yildirim, A. C., Toda, K., Saito, T., "METAL ION DIFFUSION THROUGH METAKAOLIN-BASED GEOPOLYMER", Migration 2023, Nantes, 2023.9.
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- (42) Terashima, M., Saito, T., Ito, M., Akagi, Y., Tachi, Y., "LOADING EFFECT ON Eu(III) BINDING ABILITY OF HUMIC ACID ISOLATED FROM DEEP SEDIMENTARY GROUNDWATER", Migration 2017, Barcelona, Spain, 2017.9.
- (43) Nagasaki, S., Yang, T., Saito, T., Riddoch, J., "SORPTION OF Np(IV) ON ILLITE, SHALE AND MX-80 IN HIGH IONIC STRENGTH SOLUTIONS", Migration 2017, Barcelona, Spain, 2017.9.
- (44) Sasaki, T., Ueda, K., Saito, T., Aoyagi, N., Kobayashi, T., Takagi, I., Kimura, T., Tachi, Y., "Sorption of Eu^{3+} on montmorillonite studied by time-resolved laser fluorescence spectroscopy and surface complexation modeling", International Workshop on Advanced Techniques for Actinide Spectroscopy (ATAS 2014), Dresden, Germany, 2014.11.
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- (46) Niida, K., Saito, T., Tanaka, S., "COMPARISON OF URANYL ADSORPTION ON IRON(III) OXYHYDROXIDES", Migration '13, Brighton, United Kingdom, 2013.9.
- (47) Hamamoto, T., Saito, T., Tanaka, S., "SIZE AND ELEMENTAL COMPOSITION ANALYSES OF GRANITIC GROUNDWATER BY FLOW-FIELD FLOW FRACTIONATION", Migration '13, Brighton, United Kingdom, 2013.9.
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- (49) Niida, K., Saito, T., Nagasaki, S., "COMPARISON OF RADIONUCLIDES ADSORPTION ON 2-LINE AND 6-LINE FERRIHYDRITES", Migration '11, Beijing, China, 2011.9.
- (50) Saito, T., "EXAFS INVESTIGATION OF THE EFFECTS OF HUMIC ACID ON URANYL ADSORPTION ON GOETHITE", Migration '11, Beijing, China, 2011.9.
- (51) Collins, R. N., Aoyagi, N., Saito, T., Payne, T. E., Kimura, T., Waite, T. D., "A LOW TEMPERATURE (77 K) TIME-RESOLVED LASER FLUORESCENCE SPECTROSCOPY STUDY ON THE AQUEOUS SPECIATION OF U(VI) IN THE PRESENCE OF FERRIHYDRITE AND CITRATE", Migration '11, Beijing, China, 2011.9.
- (52) Lukman, S., Saito, T., Nagasaki, S., Kimura, T., "INVESTIGATION OF EUROPIUM(III) SPECIATION WITH HUMIC SUBSTANCES FROM VARIOUS ORIGINS: APPLICATION OF TRLFS-PARAFAC", Migration '11, Beijing, China, 2011.9.
- (53) Saito, T., Aoyagi, N., Kimura, T., Nagasaki, S., Tanaka, S., "Complexation of Eu^{3+} with humic substances studied by time-resolved laser fluorescence spectroscopy and parallel factor analysis", Goldschmidt 2011, Prague, Czech Republic, 2011.8.
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- (58) Ishida, K., Saito, T., Aoyagi, N., Kimura, T., Nagasaki, S., Tanaka, S., "STUDY ON THE SURFACE COMPLEXES OF Eu(III) ON KAOLINITE BY TIME-RESOLVED LASER FLUORESCENCE SPECTROSCOPY (TRLFS): TRLFS MEASUREMENT IN H₂O/D₂O SYSTEMS ", Migration '09, Kennewich, USA, 2009.9.
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