

Keiko Nishikawa

Emeritus Professor, Chiba University

[Present Position]

Research Fellow at Toyota Physical and Chemical Research Institute

[Research Field]

Physical Chemistry, Structural Chemistry of Disordered Materials, Condensed Matter Physics

[Date of Birth]

November 27, 1948

[Sex] Female

[Nationality] Japan

[Academic Background]

Mar. 1972 Faculty of Science, Department of Chemistry, The University of Tokyo

Mar. 1974 Graduate School of Science, Department of Chemistry, Master Course,
The University of Tokyo

Mar. 1981 Doctor of Science (The University of Tokyo)

(Thesis Title: The Construction of Energy-Dispersive X-Ray Diffractometer for
Liquids and Structure of Liquids)

[Professional Career]

Aug. 1974–Mar. 1991 Assistant Professor, Faculty of Science, Gakushyuin University

Apr. 1991–Mar. 1996 Associate Professor, Faculty of Education, Yokohama National University

Apr. 1996–Mar. 2014 Professor, Graduate School of National Science, Chiba University

Jun. 2014–Mar. 2018 Research Professor, Chiba University

Jun. 2014 Emeritus Professor, Chiba University

Apr. 2014–Aug. 2018 Inspector General, Japan Society for the Promotion of Science (JSPS)

Apr. 2018–Present Research Fellow, Toyota Physical and Chemical Research Institute

[Membership]

Chemical Society of Japan, Physical Society of Japan, Japan Society for Molecular Science,
The Crystallographic Society of Japan, The Japanese Society for Synchrotron Research, Ionic
Liquid Research Association

[Honors and Awards]

- 1988 CrSJ (The Crystallographic Society of Japan) Award
- 1998 Saruhashi Prize from “the Association for the Bright Future of Woman Scientists”
- 2012 CSJ (Chemistry Society of Japan) Award
- 2012 Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology
- 2013 Medal with Purple Ribbon from Government of Japan
- 2014 Award of Japan Society for Molecular Science

Publication List (2019)

Keiko Nishikawa

I. Original papers

- 1) Structure of Polyvanadotungstates I. The Crystal Structure of $\alpha\text{-(CN}_3\text{H}_6)_4\text{V}_2\text{W}_4\text{O}_{19}$.
K. Nishikawa, A. Kobayashi and Y. Sasaki
Bull. Chem. Soc. Jpn., **48**, 889 (1975).
- 2) Structure of Polyvanadotungstates II. The Crystal Structure of $\text{K}_7\text{V}_5\text{W}_8\text{O}_{40} \cdot 12\text{H}_2\text{O}$.
K. Nishikawa, A. Kobayashi and Y. Sasaki
Bull. Chem. Soc. Jpn., **48**, 3152 (1975).
- 3) The Construction of Energy-Dispersive X-ray Diffractometer for Liquids and Its application to CCl_4 .
Y. Murata and K. Nishikawa
Bull. Chem. Soc. Jpn., **51**, 411 (1978).
- 4) Liquids Structure of CCl_4 and Long-Range Correlation.
K. Nishikawa and Y. Murata
Bull. Chem. Soc. Jpn., **52**, 293 (1979).
- 5) The Temperature Dependence of the Liquid Structure of CCl_4 .
K. Nishikawa, K. Tohji, M. Shima and Y. Murata
Chem. Phys. Lett., **64**, 154 (1979).
- 6) Direct Observation of Phase Transformation Process by Energy-Dispersive X-ray Diffractometry.
K. Tohji, K. Nishikawa and Y. Murata
Jpn. J. Appl. Phys., **19**, L365 (1980).
- 7) X-ray Diffraction Study of Liquid Water.
K. Nishikawa and N. Kitagawa
Bull. Chem. Soc. Jpn., **53**, 2804 (1980).
- 8) X-ray Diffraction Study of Liquid Methanol.
M. Tanaka, K. Nishikawa and T. Fujiyama
Chem. Lett., **327** (1981).
- 9) The Intermolecular Arrangement in Plastic Crystal (Phase Ia) of Carbon Tetrachloride Studied by X-ray Diffraction.
K. Nishikawa, K. Tohji and Y. Murata
J. Chem. Phys., **74**, 5817 (1981).
- 10) X-ray Diffraction Study of Mixing State in the Carbon Tetrachloride Solutions of Methanol and Pentane.
M. Tanaka, K. Nishikawa, K. Tohji and T. Fujiyama
Bull. Chem. Soc. Jpn., **56**, 1273 (1983).
- 11) Correction for Intensity Data in Energy-Dispersive X-ray Diffractometry of Liquids. Application to Carbon Tetrachloride.
K. Nishikawa and T. Iijima
Bull. Chem. Soc. Jpn., **57**, 1750 (1984).
- 12) Clathrate-like Structure of Water around Some Nonelectrolytes in Dilute Solution as Revealed by Computer Simulation and X-ray Diffraction Studies.
H. Tanaka, K. Nishikawa and K. Nakanishi
J. Inclusion Studies, **2**, 119 (1984).

- 13) Structure Model for Liquid Carbon Tetrachloride.
K. Nishikawa and T. Iijima
Bull. Chem. Soc. Jpn., **58**, 1215 (1985).
- 14) Mean Square Deviations of Interatomic Distances in Liquid Carbon Tetrachloride.
K. Nishikawa and T. Iijima
Bull. Chem. Soc. Jpn., **58**, 1220 (1985).
- 15) Use of Reciprocal Space Expansion in the Analysis of X-ray Scattering Intensities from Liquids.
T. Iijima and K. Nishikawa
Chem. Phys. Lett., **115**, 522 (1985).
- 16) Reciprocal Space Expansion in the Analysis of X-ray Scattering Intensities from Liquid CCl₄.
K. Nishikawa and T. Iijima
Bull. Chem. Soc. Jpn., **59**, 117 (1986).
- 17) Structure Model for Liquid Neopentane.
K. Nishikawa
Bull. Chem. Soc. Jpn., **59**, 2920 (1986).
- 18) Determination of Energy Spectrum of the Primary Beam in Energy-Dispersive Diffractometry.
K. Nishikawa, K. Ishizawa, K. Koderu and T. Iijima
Jpn. J. Appl. Phys., **25**, 1431(1986).
- 19) Simple Relationship between the Kirkwood-Buff Parameters and the Fluctuations of the Particle Number and Concentration Obtained by Small-Angle X-ray Scattering.
K. Nishikawa
Chem. Phys. Lett., **132**, 50 (1986).
- 20) Structure Study on Liquid 1,1,1-trichloroethane Using Energy-Dispersive Diffractometer.
(in Japanese)
K. Nishikawa, K. Nagano, T. Iijima
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- 21) Fluctuations in the Particle Number and Concentration and the Kirkwood-Buff Parameters of *tert*-Butyl Alcohol and Water Mixtures Studied by Small-Angle X-ray Scattering.
K. Nishikawa, Y. Koderu and T. Iijima
J. Phys. Chem., **91**, 3694 (1987).
- 22) Binding and Correlation Effects in Nitrogen and Oxygen and the Correlation Effects in Neon, as Studied by Gas X-ray Diffraction.
K. Nishikawa and T. Iijima
J. Chem. Phys., **87**, 3753 (1987).
- 23) Structural Study of Liquid 1,1,1-Trichloroethane by X-ray Diffraction.
K. Nishikawa and T. Iijima
Bull. Chem. Soc. Jpn., **61**, 217 (1988).
- 24) X-ray Inelastic Scattering Intensity Measured by the Energy-Dispersive Diffractometry.
T. Iijima and K. Nishikawa
J. Appl. Cryst., **21**, 943 (1988).
- 25) Temperature Dependence of the Concentration Fluctuation, the Kirkwood-Buff Parameters and the Correlation Length of *tert*-Butyl Alcohol and Water Mixtures Studied by Small-Angle X-ray Scattering.

- K. Nishikawa, H. Hayashi and T. Iijima
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- 26) Construction of a Small-Angle X-ray Scattering Diffractometer for Study of Fluctuations in Solutions.
H. Hayashi, K. Nishikawa and T. Iijima
Jpn. J. Appl. Phys., **28**, 1501 (1989).
- 27) The Micropore Swelling of Activated Carbon Fibers with Water Adsorption Studied by Use of in situ Small-Angle X-ray Scattering.
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- 28) Easy Deduction of the Formula Relating the Fluctuations of a Binary System to the X-ray Scattering Intensity Extrapolated to $s = 0$.
H. Hayashi, K. Nishikawa and T. Iijima
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- 29) Structural Study of tert-Butyl Alcohol and Water Mixtures by X-ray Diffraction.
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J. Phys. Chem., **94**, 6227 (1990).
- 30) Small-Angle X-ray Scattering Study of Fluctuations in 1-Propanol-Water and 2-Propanol- Water Systems.
H. Hayashi, K. Nishikawa and T. Iijima
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- 31) Surface Fractal Dimension of Microporous Carbon Fibers by Nitrogen Adsorption.
K. Kaneko, M. Sato, T. Suzuiki, Y. Fujiwara K. Nishikawa and M. Jaroniec
J. Chem. Soc. Faraday Trans., **87**, 179 (1991).
- 32) Accuracy of Intensity Measurement by Use of an Area Detector with a Photostimulable Phosphor Screen, as Confirmed by Measuring Scattering Intensity from a Liquid.
K. Nishikawa, Y. Sakamoto and T. Iijima
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- 33) A Simulation Study of Small-Angle X-ray Scattering Behavior of Activated Carbon Fibers Adsorbing Water.
Y. Fujiwara, K. Nishikawa, T. Iijima and K. Kaneko
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- 34) Small-Angle X-ray Scattering Study of Fluctuations in Ethanol and Water Mixtures.
K. Nishikawa and T. Iijima
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- 35) Construction of Sample Holder for X-ray Diffraction Experiments on Supercritical Fluids.
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- 36) Structure Model of Liquid Water as Investigated by the Method of Reciprocal Space Expansion.
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- 38) Anomalous X-ray Scattering from Aqueous 2-Butoxyethanol at $x_{BE}=0.06$ near Freezing.
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- 40) An Ordered Water Molecular Assembly Structure in a Slit-shaped Carbon Nanospace.
T. Iiyama, K. Nishikawa, T. Otowa and K. Kaneko
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- 41) Correlation Lengths and Density Fluctuations in Supercritical State of Carbon Dioxide.
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- 45) Reply to Comment on the Correlation Lengths and Density Fluctuations in Supercritical State of Carbon Dioxide.
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T. Morita, K. Nishikawa, M. Takematsu, H. Iida and S. Furutaka
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- 47) Study of the Structure of Water Molecular Assembly in a Hydrophobic Nanospace at Low Temperature with in situ X-ray Diffraction.
T. Iiyama, K. Nishikawa, T. Suzuki and K. Kaneko
Chem. Phys. Lett., **274**, 152-158 (1997).
- 48) Fluid Behavior at Supercritical States Studied by Small-Angle X-Ray Scattering.
K. Nishikawa and T. Morita
J. Supercritical Fluids **13**, 143-148 (1998).
- 49) Influence of Fine Particles on Carbon Deposition in the Coke Oven Chamber.
T. Nakagawa, T. Suzuki, A. Furusawa, Y. Maeno, I. Komaki and K. Nishikawa
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- 50) Study on Graphitization of Glassy Carbon Using Small-Angle X-Ray Diffractometry. (in Japanese)
K. Fukuyama, T. Nishizawa, K. Nishikawa
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- 51) Construction of the Sample Holder and Small-Angle X-ray scattering Measurement for

Supercritical Water.

T. Morita, H. Miyagi, Y Shimokawa, H. Matsuo and K. Nishikawa

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- 52) Structure Change of Glass-like Carbon with Heat Treatment, Studied by Small-Angle X-ray Scattering: I Glass-like Carbon Prepared from Phenolic Resin
K. Nishikawa, K. Fukuyama and T. Nishizawa
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- 53) Development of Thermal Conductivity Measurement for Fluids which is Convenient and Effective for Samples near the Critical Point.
Zai-hau Chen, K. Tozaki and K. Nishikawa
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- 54) Change of Surface Fractal Dimension for Witbank Coal with Heat Treatment Studied by Small Angle X-ray Scattering.
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- 55) Pore-Width-Dependent Ordering of C₂H₅OH Molecules Contained in Graphitic Slit Nanopores.
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- 56) Evaluation and Countermeasures of Convective Heat Transfer on Thermal Conductivity Measurement Using the Peltier Effect and Application to Supercritical CO₂.
Z. Chen, K. Tozaki and K. Nishikawa
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- 57) Fractal Structural Change of Witbank Coal with Heat Treatment Studied by Small Angle X-ray Scattering.
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Y. Kasahara and K. Nishikawa
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- 59) Inhomogeneity of Molecular Distribution in Supercritical Fluids.
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- 60) Study of Inhomogeneity of Supercritical Water by Small-angle X-ray Scattering.
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- 61) Raman Spectral Changes of Neat CO₂ across the Ridge of Density Fluctuation in Supercritical Region.
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- 62) A Thermodynamic Study of Aqueous Acetonitrile: Excess Chemical Potentials, Partial Molar Enthalpies, Entropies and Volumes, and Fluctuations.
P. V. Nikolova, S. J. B. Duff, P. Westh, C. A. Haynes, Y. Kasahara, K. Nishikawa and Y. Koga
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- 63) Supercritical-Fluid Cell with Device of Variable Optical Path Length Giving Fringe-Free Terahertz Spectra.
K. Saitow, K. Nishikawa, H. Ohtake, N. Sarukura, H. Miyagi, Y. Shimokawa, H. Matsuo and K. Tominaga
Rev. Sci. Instrum., **71**, 4061-4064 (2000).
- 64) Small-angle X-ray Scattering Study on Pore Structure of Carbon Fiber Prepared from Polymer Blend of Phenolic Resin and Polystyrene.
K. Fukuyama, Y. Kasahara, N. Kasahara, A. Oya and K. Nishikawa
Carbon **39**, 287-290 (2001).
- 65) Effect of Hot Isostatic Pressing on Nanopore in Glass-like Carbon Prepared from Phenol Formaldehyde Resin.
K. Fukuyama, T. Nishizawa and K. Nishikawa
Carbon **39**, 1863-1867 (2001).
- 66) Investigation of Pore Structure in Glass-like Carbon Prepared from Furan Resin.
K. Fukuyama, T. Nishizawa and K. Nishikawa
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- 67) Construction of a Sample Cell of Poisonous Organic Solvents in Supercritical State for Small-Angle X-ray Scattering Measurements.
A. Ayusawa, K. Kusano, T. Morita, H. Miyagi, Y. Shimokawa, H. Matsuo and K. Nishikawa
Jpn. J. Appl. Phys. **40**, 4260-61 (2001).
- 68) Terahertz Absorption Spectra of Supercritical CHF₃ to Investigate Local Structure through Rotational and Hindered Rotational Motions.
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Chem. Phys. Lett. **341**, 86-92 (2001).
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Rev. Sci. Instrum. **72**, 3013-3018 (2001).
- 70) Mixing Schemes of Aqueous Dimethyl Sulfoxide: A Support by X-ray Diffraction Data.
Y. Koga, Y. Kasahara, K. Yoshino and K. Nishikawa
J. Sol. Chem. **30**, 885-893 (2001).
- 71) Inhomogeneity of Mixing in Acetonitrile Aqueous Solution Studied by Small-Angle X-ray Scattering.
K. Nishikawa, Y. Kasahara and T. Ichioka
J. Phys. Chem. **B 106**, 693-700 (2002)
- 72) Correlation Time of Density Fluctuation for Supercritical Ethylene Studied by Dynamic Light Scattering.
K. Saitow, H. Ochiai, T. Kato and K. Nishikawa
J. Chem. Phys. **116**, 4985-4992 (2002).
- 73) Density-Fluctuation-Induced Swelling of Polymer Thin Films in Carbon Dioxide.
T. Koga, Y-S. Seo, Y. Zhang, K. Shin, K. Kusano, K. Nishikawa, M. H. Rafailovich, J. C. Sokolov, B. Chu, D. Peiffer, and S. K. Satija
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- K. Tozaki, J. Kudo, Z. Chen and K. Nishikawa
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J. Chem. Phys. **118**, 1341-1346 (2003).
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K. Nishikawa and Y. Koga
Can. J. Chem. **81**, 141-149 (2003).
- 80) Excess Partial Molar Entropy of Alkane-mono-ols in Aqueous Solutions at 25 °C.
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Can. J. Chem. **81**, 150-155 (2003)
- 81) Investigation of Structural Fluctuation of Supercritical Benzene by Small-angle X-ray Scattering.
A. A. Arai, T. Morita and K. Nishikawa
J. Chem. Phys. **119**, 1502-1509 (2003)
- 82) X-ray Absorption Fine Structure Study on Residue Bromine in Carbons with Different Graphitization Degree.
H. Yoshikawa, K. Fukuyama, Y. Nakahara, T. Konishi, N. Ichikuni, Y. Yoshikawa, N. Akuzawa,
Y. Takahashi and K. Nishikawa
Carbon **41**, 2931-2938 (2003).
- 83) Dynamics of Density Fluctuation of Supercritical Fluid Mapped on Phase Diagram.
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- 84) The Effects of Na₂SO₄ and NaClO₄ on the Molecular Organization of H₂O.
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J. Phys. Chem. A **108**, 3873-3877 (2004).
- 86) Density Fluctuation of Supercritical Fluids Obtained from Small-angle X-ray Scattering Experiment and Thermodynamic Calculation.
K. Nishikawa, A. A. Arai and T. Morita
J. Supercritical Fluids **30**, 249-257 (2004).
- 87) How are Hydrogen Bonds Perturbed in Aqueous NaClO₄ Solution Depending on the Concentration?

A Near Infrared Study of Water.

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88) Fluctuations in Density and Concentration of Methanol-Water Mixtures at 7 MPa and 373, 423 K Studied by Small-Angle X-ray Scattering.

T. Morita and K. Nishikawa

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89) The Structure Study of Room-Temperature Ionic Liquid 1-n-butyl-3-methylimidazolium Iodide Utilizing Wide-Angle X-ray Scattering and Raman Spectroscopy.

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K. Saitow, H. Nakayama, K. Ishii and K. Nishikawa

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91) Towards Understanding the Hofmeister Series (1): The Effect of Sodium Salts of Some Anions on the Molecular Organization of H₂O.

Y. Koga, P. Westh, J. V. Davies, K. Miki, K. Nishikawa H. Katayanagi

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92) Mixing Schemes in Ionic Liquid– H₂O Systems: A thermodynamic study.

H. Katayanagi, K. Nishikawa, H. Shimozaki, K. Miki, P. Westh and Y. Koga

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93) Mesocellular Foam Carbons: Aggregates of Hollow Carbon Spheres with Open and Closed Wall Structures.

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94) Novel detection method of Liquid-Liquid phase separation

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95) Analysis to obtain precise density fluctuation of supercritical fluids by small-angle X-ray scattering

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97) Volume-variable sample holder for small-angle X-ray scattering measurements of supercritical solutions and application to a CHF₃-CO₂ mixture

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D. Kajiya K. Nishikawa and K. Saitow
J. Phys. Chem. A **109**, 7365-7370 (2005)
- 101) Novel method to measure heat capacity of supercritical fluids by using the Peltier elements.
K. Tozaki, Y. Kido, Y. Koga and K. Nishikawa
Jpn J. Appl. Phys. **45**, 269-273 (2006).
- 102) Density Dependences of Long-range Fluctuations and Short-range Correlation Lengths of CHF₃ and CH₂F₂ in Supercritical State.
T. Morita, Y. Takahashi, Y. Tanaka, A. A. Arai and K. Nishikawa
J. Chem. Phys. **124**, 124549/1-6 (2006).
- 103) Air oxidation of Carbon Spheres II Micropore Development
M. Inagaki, T. Nishikawa, K. Oshida, K. Fukuyama, Y. Hatakeyama, and K. Nishikawa
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- 106) Development of polarized Raman spectrometer for supercritical fluids having high critical points.
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- 107) Br K-edge XAFS Analyses of IBr Residue Carbon Compounds.
H. Yoshikawa, K. Uno, N. Akuzawa, T. Konishi, T. Fujjika and K. Nishikawa
Carbon (submitted)
- 108) Anomalous dynamic behavior of ions and water molecules in dilute aqueous solution of 1-butyl-3-methylimidazolium bromide studied by NMR.
M. Nakakoshi, S. Ishihara, H. Utsumi, H. Seki, Y. Koga, and K. Nishikawa
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