Takamasa Sakai

List of Publications by Year
in descending order

142 papers	6,219 citations	76196 40 h-index	74018 75 g-index
167 all docs	167 docs citations	167 times ranked	4490 citing authors

#	Article	IF	Citations
1	Design and Fabrication of a High-Strength Hydrogel with Ideally Homogeneous Network Structure from Tetrahedron-like Macromonomers. Macromolecules, 2008, 41, 5379-5384.	2.2	1,040
2	â€œNonswellableâ€•Hydrogel Without Mechanical Hysteresis. Science, 2014, 343, 873-875.	6.0	511
3	Structure Characterization of Tetra-PEG Gel by Small-Angle Neutron Scattering. Macromolecules, 2009, 42, 1344-1351.	2.2	247
4	SANS and SLS Studies on Tetra-Arm PEG Gels in As-Prepared and Swollen States. Macromolecules, 2009, 42, 6245-6252.	2.2	227
5	Transition between Phantom and Affine Network Model Observed in Polymer Gels with Controlled Network Structure. Macromolecules, 2013, 46, 1035-1040.	2.2	172
6	Connectivity and Structural Defects in Model Hydrogels: A Combined Proton NMR and Monte Carlo Simulation Study. Macromolecules, 2011, 44, 9666-9674.	2.2	161
7	Fast-forming hydrogel with ultralow polymeric content as an artificial vitreous body. Nature Biomedical Engineering, 2017, 1, .	11.6	150
8	Highly Elastic and Deformable Hydrogel Formed from Tetraâ€arm Polymers. Macromolecular Rapid Communications, 2010, 31, 1954-1959.	2.0	136
9	Examination of the Theories of Rubber Elasticity Using an Ideal Polymer Network. Macromolecules, 2011, 44, 5817-5821.	2.2	133
10	High-performance ion gel with tetra-PEG network. Soft Matter, 2012, 8, 1756-1759.	1.2	129
11	Yielding Criteria of Double Network Hydrogels. Macromolecules, 2016, 49, 1865-1872.	2.2	119
12	Evaluation of Topological Defects in Tetra-PEG Gels. Macromolecules, 2010, 43, 488-493.	2.2	112
13	Design of Hydrogels for Biomedical Applications. Advanced Healthcare Materials, 2015, 4, 2360-2374.	3.9	108
14	Fracture energy of polymer gels with controlled network structures. Journal of Chemical Physics, 2013, 139, 144905.	1.2	102
15	Synthesis and Fracture Process Analysis of Double Network Hydrogels with a Well-Defined First Network. ACS Macro Letters, 2013, 2, 518-521.	2.3	99
16	Kinetic Aspect on Gelation Mechanism of Tetra-PEG Hydrogel. Macromolecules, 2014, 47, 3274-3281.	2.2	76
17	Network elasticity of a model hydrogel as a function of swelling ratio: from shrinking to extreme swelling states. Soft Matter, 2018, 14, 9693-9701.	1.2	71
18	Precise Control and Prediction of Hydrogel Degradation Behavior. Macromolecules, 2011, 44, 3567-3571.	2.2	67

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19	Evaluation of Gelation Kinetics of Tetra-PEG Gel. Macromolecules, 2010, 43, 3935-3940.	2.2	66
20	Effect of swelling and deswelling on the elasticity of polymer networks in the dilute to semi-dilute region. Soft Matter, 2012, 8, 2730.	1.2	66
21	Nonâ€Osmotic Hydrogels: A Rational Strategy for Safely Degradable Hydrogels. Angewandte Chemie - International Edition, 2016, 55, 9282-9286.	7.2	58
22	Experimental verification of homogeneity in polymer gels. Polymer Journal, 2014, 46, 517-523.	1.3	57
23	Dynamic Covalent Star Poly(ethylene glycol) Model Hydrogels: A New Platform for Mechanically Robust, Multifunctional Materials. Macromolecules, 2017, 50, 2155-2164.	2.2	57
24	Near-Model Amphiphilic Polymer Conetworks Based on Four-Arm Stars of Poly(vinylidene fluoride) and Poly(ethylene glycol): Synthesis and Characterization. Macromolecules, 2018, 51, 2476-2488.	2.2	57
25	SANS Studies on Tetra-PEG Gel under Uniaxial Deformation. Macromolecules, 2011, 44, 1203-1210.	2.2	54
26	Exploiting gradients in cross-link density to control the bending and self-propelled motion of active gels. Journal of Materials Chemistry, 2011, 21, 8360.	6.7	51
27	Reliable Hydrogel with Mechanical â€œFuse Linkâ€• in an Aqueous Environment. Advanced Materials, 2015, 27, 7407-7411.	11.1	51
28	Precision polymer network science with tetra-PEG gelsâ€"a decade history and future. Colloid and Polymer Science, 2019, 297, 1-12.	1.0	50
29	Gelation mechanism and mechanical properties of Tetra-PEG gel. Reactive and Functional Polymers, 2013, 73, 898-903.	2.0	49
30	Nearly Ideal Polymer Network Ion Gel Prepared in pH-Buffering Ionic Liquid. Macromolecules, 2016, 49, 344-352.	2.2	48
31	Ultimate elongation of polymer gels with controlled network structure. RSC Advances, 2013, 3, 13251.	1.7	47
32	Sol-gel transition behavior near critical concentration and connectivity. Polymer Journal, 2016, 48, 629-634.	1.3	47
33	Organized Monolayer of Thermosensitive Microgel Beads Prepared by Double-Template Polymerization. Langmuir, 2007, 23, 8651-8654.	1.6	46
34	Mechanical properties of a polymer network of Tetra-PEG gel. Polymer Journal, 2013, 45, 300-306.	1.3	46
35	Kinetic Study for AB-Type Coupling Reaction of Tetra-Arm Polymers. Macromolecules, 2012, 45, 1031-1036.	2.2	45
36	Enzymatic Synthesis of Cellulose Oligomer Hydrogels Composed of Crystalline Nanoribbon Networks under Macromolecular Crowding Conditions. ACS Macro Letters, 2017, 6, 165-170.	2.3	45

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37	Autonomous viscosity oscillation by reversible complex formation of terpyridine-terminated poly(ethylene glycol) in the BZ reaction. Soft Matter, 2010, 6, 6072.	1.2	44
38	Small-Angle Neutron Scattering Study on Defect-Controlled Polymer Networks. Macromolecules, 2014, 47, 1801-1809.	2.2	43
39	Structural Analysis of High Performance Ion-Gel Comprising Tetra-PEG Network. Macromolecules, 2012, 45, 3902-3909.	2.2	42
40	High-performance gel electrolytes with tetra-armed polymer network for Li ion batteries. Journal of Power Sources, 2015, 286, 470-474.	4.0	41
41	Rubber elasticity for incomplete polymer networks. Journal of Chemical Physics, 2012, 137, 224903.	1.2	40
42	Strain energy density function of a near-ideal polymer network estimated by biaxial deformation of Tetra-PEG gel. Soft Matter, 2012, 8, 8217.	1.2	40
43	Experimental verification of fracture mechanism for polymer gels with controlled network structure. Soft Matter, 2014, 10, 6658-6665.	1.2	40
44	Fabrication and Structural Characterization of Module-Assembled Amphiphilic Conetwork Gels. Macromolecules, 2016, 49, 4940-4947.	2.2	38
45	Silk Resin with Hydrated Dual Chemical-Physical Cross-Links Achieves High Strength and Toughness. Biomacromolecules, 2017, 18, 1937-1946.	2.6	38
46	Design of novel biomimetic polymer gels with self-oscillating function. Science and Technology of Advanced Materials, 2002, 3, 95-102.	2.8	35
47	Carbon Dioxide Separation Using a High-toughness Ion Gel with a Tetra-armed Polymer Network. Chemistry Letters, 2015, 44, 17-19.	0.7	34
48	Solvation Structure of Poly(ethylene glycol) in Ionic Liquids Studied by High-energy X-ray Diffraction and Molecular Dynamics Simulations. Macromolecules, 2013, 46, 2369-2375.	2.2	33
49	Fracture Process of Double-Network Gels by Coarse-Grained Molecular Dynamics Simulation. Macromolecules, 2018, 51, 3075-3087.	2.2	32
50	Enzyme-Catalyzed Bottom-Up Synthesis of Mechanically and Physicochemically Stable Cellulose Hydrogels for Spatial Immobilization of Functional Colloidal Particles. Biomacromolecules, 2018, 19, 1269-1275.	2.6	32
51	Diffusion Behavior of Water Molecules in Hydrogels with Controlled Network Structure. Macromolecules, 2019, 52, 1923-1929.	2.2	32
52	Tri-branched gels: Rubbery materials with the lowest branching factor approach the ideal elastic limit. Science Advances, 2022, 8, eabk0010.	4.7	32
53	Microscopic Structure of the â€œNonswellableâ€•Thermoresponsive Amphiphilic Conetwork. Macromolecules, 2017, 50, 3388-3395.	2.2	31
54	Experimental Observation of Two Features Unexpected from the Classical Theories of Rubber Elasticity. Physical Review Letters, 2017, 119, 267801.	2.9	31

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55	Gels: From Soft Matter to BioMatter. Industrial & Engineering Chemistry Research, 2018, 57, 1121-1128.	1.8	31
56	Anomalous volume phase transition in a polymer gel with alternative hydrophilicâ€“amphiphilic sequence. Soft Matter, 2012, 8, 6876.	1.2	30
57	Structure-property relationship of a model network containing solvent. Science and Technology of Advanced Materials, 2019, 20, 608-621.	2.8	30
58	Mechanical Properties of Polymer Gels with Bimodal Distribution in Strand Length. Macromolecules, 2013, 46, 7027-7033.	2.2	29
59	Multiscale Dynamics of Inhomogeneity-Free Polymer Gels. Macromolecules, 2014, 47, 763-770.	2.2	29
60	Mechanical properties of tetra-PEG gels with supercoiled network structure. Journal of Chemical Physics, 2014, 140, 074902.	1.2	27
61	Degradation Behavior of Polymer Gels Caused by Nonspecific Cleavages of Network Strands. Chemistry of Materials, 2014, 26, 5352-5357.	3.2	24
62	Rubber elasticity for percolation network consisting of Gaussian chains. Journal of Chemical Physics, 2015, 143, 184905.	1.2	24
63	An ionic liquid gel with ultralow concentrations of tetra-arm polymers: Gelation kinetics and mechanical and ion-conducting properties. Polymer, 2019, 166, 38-43.	1.8	24
64	Connectivity dependence of gelation and elasticity in AB-type polymerization: an experimental comparison of the dynamic process and stoichiometrically imbalanced mixing. Soft Matter, 2019, 15, 5017-5025.	1.2	24
65	Electrophoretic Mobility of Double-Stranded DNA in Polymer Solutions and Gels with Tuned Structures. Macromolecules, 2014, 47, 3582-3586.	2.2	23
66	Defect-free network formation and swelling behavior in ionic liquid-based electrolytes of tetra-arm polymers synthesized using a Michael addition reaction. Physical Chemistry Chemical Physics, 2017, 19, 29984-29990.	1.3	23
67	Permeation of Water through Hydrogels with Controlled Network Structure. Macromolecules, 2017, 50, 9411-9416.	2.2	22
68	Universal Equation of State Describes Osmotic Pressure throughout Gelation Process. Physical Review Letters, 2020, 125, 267801.	2.9	20
69	Probe Diffusion of Solâ€“Gel Transition in an Isorefractive Polymer Solution. Macromolecules, 2017, 50, 2916-2922.	2.2	19
70	Structure and physical properties of dried Tetra-PEG gel. Polymer, 2011, 52, 4123-4128.	1.8	18
71	A computer simulation of the networked structure of a hydrogel prepared from a tetra-armed star pre-polymer. Soft Matter, 2014, 10, 3553.	1.2	18
72	Linear elasticity of polymer gels in terms of negative energy elasticity. Polymer Journal, 2021, 53, 1293-1303.	1.3	18

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73	Migration Behavior of Rodlike dsDNA under Electric Field in Homogeneous Polymer Networks. Macromolecules, 2013, 46, 8657-8663.	2.2	17
74	Swelling Behaviors of Hydrogels with Alternating Neutral/Highly Charged Sequences. Macromolecules, 2020, 53, 8244-8254.	2.2	17
75	BrÃ¸nsted Basicity of Solute Butylamine in an Aprotic Ionic Liquid Investigated by Potentiometric Titration. Chemistry Letters, 2013, 42, 1250-1251.	0.7	16
76	Chemoenzymatic synthesis of polypeptides consisting of periodic di- and tri-peptide motifs similar to elastin. Polymer Chemistry, 2018, 9, 2336-2344.	1.9	15
77	Three cooperative diffusion coefficients describing dynamics of polymer gels. Chemical Communications, 2018, 54, 6784-6787.	2.2	15
78	Relationship between Bulk Physicochemical Properties and Surface Wettability of Hydrogels with Homogeneous Network Structure. Langmuir, 2020, 36, 5554-5562.	1.6	15
79	Shrinking Kinetics of Polymer Gels with Alternating Hydrophilic/Thermoresponsive Prepolymer Units. Macromolecules, 2013, 46, 4114-4119.	2.2	14
80	Gelation Mechanism of Tetra-armed Poly(ethylene glycol) in Aprotic Ionic Liquid Containing Nonvolatile Proton Source, Protic Ionic Liquid. Journal of Physical Chemistry B, 2015, 119, 4795-4801.	1.2	14
81	SANS Study on Critical Polymer Clusters of Tetra-Functional Polymers. Macromolecules, 2017, 50, 3655-3661.	2.2	14
82	Insight into the Microscopic Structure of Module-Assembled Thermoresponsive Conetwork Hydrogels. Macromolecules, 2018, 51, 6645-6652.	2.2	14
83	Starâ€Polymerâ€“DNA Gels Showing Highly Predictable and Tunable Mechanical Responses. Advanced Materials, 2022, 34, e2108818.	11.1	14
84	Implementation of tetra-poly(ethylene glycol) hydrogel with high mechanical strength into microfluidic device technology. Biomicrofluidics, 2013, 7, 054109.	1.2	13
85	Effect of Swelling and Deswelling on Mechanical Properties of Polymer Gels. Macromolecular Symposia, 2015, 358, 128-139.	0.4	13
86	Slope-Dependent Cell Motility Enhancements at the Walls of PEG-Hydrogel Microgroove Structures. Langmuir, 2015, 31, 10215-10222.	1.6	13
87	Probing the cross-effect of strains in non-linear elasticity of nearly regular polymer networks by pure shear deformation. Journal of Chemical Physics, 2015, 142, 174908.	1.2	13
88	Nonâ€Osmotic Hydrogels: A Rational Strategy for Safely Degradable Hydrogels. Angewandte Chemie, 2016, 128, 9428-9432.	1.6	12
89	Association Behavior of Poly(ethylene oxide)â€“Poly(propylene oxide) Alternating Multiblock Copolymers in Water toward Thermally Induced Phase Separation. Langmuir, 2017, 33, 14649-14656.	1.6	12
90	Electrochemical Properties of a TetraPEG-based Gel Electrolyte Containing a Nonflammable Fluorinated Alkyl Phosphate for Safer Lithium-ion Batteries. Chemistry Letters, 2018, 47, 909-912.	0.7	12

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91	Phase Transition Behaviors of Self-Oscillating Polymer and Nano-Gel Particles. Macromolecular Rapid Communications, 2005, 26, 1140-1144.	2.0	11
92	Effect of prepolymer architecture on the network structure formed by AB-type crosslink-coupling. Polymer Journal, 2014, 46, 14-20.	1.3	11
93	TetraPEG Network Formation via a Michael Addition Reaction in an Ionic Liquid: Application to Polymer Gel Electrolyte for Electric Double-layer Capacitors. Chemistry Letters, 2019, 48, 704-707.	0.7	11
94	On-demand retrieval of cells three-dimensionally seeded in injectable thioester-based hydrogels. RSC Advances, 2021, 11, 23637-23643.	1.7	11
95	Temperature Dependence of Polymer Network Diffusion. Physical Review Letters, 2021, 127, 237801.	2.9	11
96	Shear Modulus Dependence of the Diffusion Coefficient of a Polymer Network. Macromolecules, 2019, 52, 9613-9619.	2.2	10
97	Mechanical Regulation Underlies Effects of Exercise on Serotonin-Induced Signaling in the Prefrontal Cortex Neurons. IScience, 2020, 23, 100874.	1.9	10
98	Dynamics of Critical Clusters Synthesized by End-Coupling of Four-Armed Poly(ethylene glycol)s. Macromolecules, 2019, 52, 5086-5094.	2.2	9
99	Dilution Effect on the Cluster Growth near the Gelation Threshold. Nihon Reoroji Gakkaishi, 2019, 47, 61-66.	0.2	9
100	Cluster growth from a dilute system in a percolation process. Polymer Journal, 2020, 52, 289-297.	1.3	9
101	Electrophoretic mobility of semi-flexible double-stranded DNA in defect-controlled polymer networks: Mechanism investigation and role of structural parameters. Journal of Chemical Physics, 2015, 142, 234904.	1.2	8
102	New design of hydrogels with tuned electro-osmosis: a potential model system to understand electro-kinetic transport in biological tissues. Journal of Materials Chemistry B, 2017, 5, 4526-4534.	2.9	8
103	Negative Energy Elasticity in a Rubberlike Gel. Physical Review X, 2021, 11, .	2.8	8
104	Experimental Comparison of Bond Lifetime and Viscoelastic Relaxation in Transient Networks with Well-Controlled Structures. ACS Macro Letters, 2022, 11, 753-759.	2.3	8
105	Mixing and Elastic Contributions to the Diffusion Coefficient of Polymer Networks. Macromolecules, 2020, 53, 7717-7725.	2.2	7
106	Hemostatic Capability of a Novel Tetra-Polyethylene Glycol Hydrogel. Annals of Vascular Surgery, 2022, 84, 398-404.	0.4	7
107	Anodic oxides on gallium phosphide for optoelectronic device and processing applications. Journal of Applied Physics, 1978, 49, 4459-4464.	1.1	6
108	Characterization of a self-oscillating polymer with periodic soluble-insoluble changes. Journal of Polymer Science, Part B: Polymer Physics, 2007, 45, 1578-1588.	2.4	6

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109	Kinetics-dominated structure and stimuli-responsiveness in the assembly of colloidal nanotubes. RSC Advances, 2016, 6, 52950-52956.	1.7	6
110	A Biomechanical Comparison of Three Miniature Locking Plate Systems in a Rabbit Radial and Ulnar Fracture Model. Veterinary and Comparative Orthopaedics and Traumatology, 2019, 32, 297-304.	0.2	5
111	Mechanical properties of doubly crosslinked gels. Polymer Journal, 2019, 51, 851-859.	1.3	5
112	Ability of Nonswelling Polyethylene Glycol-Based Vitreous Hydrogel to Maintain Transparency in the Presence of Vitreous Hemorrhage. Translational Vision Science and Technology, 2019, 8, 33.	1.1	5
113	Effect of Nonlinear Elasticity on the Swelling Behaviors of Highly Swollen Polyelectrolyte Gels. Gels, 2021, 7, 25.	2.1	5
114	æ§‹é€ æ˜Žç¢ºãªé«˜åˆ†åã‚²ãƒ«ã®ã‚²ãƒ«åŒ–éŽç¨‹ãŠã‚ˆã³ç‰©æ€§ã®è§£æ˜Žã«é–¢ã™ã‚‹ç ”ç©¶. Nihon Reoroji Gakkaishi, 2019, 47, 183-1	0.2	5
115	Brownian simulations for tetra-gel-type phantom networks composed of prepolymers with bidisperse arm length. Soft Matter, 2022, 18, 4715-4724.	1.2	5
116	Supercoiling transformation of chemical gels. Soft Matter, 2015, 11, 7101-7108.	1.2	4
117	Surgical sealants with tunable swelling, burst pressures, and biodegradation rates. Journal of Biomedical Materials Research - Part B Applied Biomaterials, 2017, 105, 1602-1611.	1.6	4
118	Synchronization of Self-Oscillation in Polymer Chains and the Cross-Linked Network. ACS Symposium Series, 2003, , 30-43.	0.5	3
119	Biomaterials: Design of Hydrogels for Biomedical Applications (Adv. Healthcare Mater. 16/2015). Advanced Healthcare Materials, 2015, 4, 2598-2598.	3.9	3
120	Preparation and characterization of a nanofiber mat consisting of Tetraâ€PEG prepolymers. Journal of Applied Polymer Science, 2015, 132, .	1.3	3
121	Co-lyophilized Aspirin with Trehalose Causes Less Injury to Human Gastric Cells and Gastric Mucosa of Rats. Digestive Diseases and Sciences, 2016, 61, 2242-2251.	1.1	3
122	Dynamics of thermoresponsive conetwork gels composed of poly(ethylene glycol) and poly(ethyl) Tj ETQq0 0 0 rgBT /Overlock 10 Tf 50	1.8	3
123	Molecular crystallization directed by polymer size and overlap under dilute and crowded macromolecular conditions. Polymer Journal, 2021, 53, 633-642.	1.3	3
124	The feasibility of a novel injectable hydrogel for protecting artificial gastrointestinal ulcers after endoscopic resection: an animal pilot study. Scientific Reports, 2021, 11, 18508.	1.6	3
125	Relationships between Mechanical Properties of Polymer Gels and Polymer Volume Fractions at Preparation and at Interested State. Nihon Reoroji Gakkaishi, 2014, 42, 97-102.	0.2	2
126	Similarity in Linear Viscoelastic Behaviors of Network Formation and Degradation Processes. Nihon Reoroji Gakkaishi, 2020, 48, 191-198.	0.2	2

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127	Non-swellability of polyelectrolyte gel in divalent salt solution due to aggregation formation. Polymer, 2022, 250, 124894.	1.8	2
128	Hydrogels: Reliable Hydrogel with Mechanical â€œFuse Linkâ€•in an Aqueous Environment (Adv. Mater.) Tj ETQq0 0 0 rgBT /Overlock 10	11.1	1
129	Robust Suture Combination for Rat Flexor Tendon Repair Model. Journal of Hand Surgery Global Online, 2020, 2, 354-358.	0.3	1
130	Structure and Properties of High Performance Gels Made by Module Assembling Method. Materials Research Society Symposia Proceedings, 2012, 1418, 99.	0.1	0
131	Back Cover: Macromol. Biosci. 6/2014. Macromolecular Bioscience, 2014, 14, 900-900.	2.1	0
132	Investigation of migration behavior of rod-like dsDNA in gel with precisely controlled network structure. Materials Research Society Symposia Proceedings, 2014, 1622, 169-174.	0.1	0
133	Mechanical properties of polymer gels with bimodal distribution in strand length. Materials Research Society Symposia Proceedings, 2014, 1622, 31-36.	0.1	0
134	Correlation Between the Physical Properties and Structure of Tetra-PEG Gels. Nippon Gomu Kyokaishi, 2014, 87, 89-95.	0.0	0
135	Molecular Dynamics Simulation of a Coarse Grained Model of Tetra-PEG Gel with Monomers of 5 and 9 particles. , 2015, , .		0
136	Injectable hydrogel with Controlled Swelling Behavior in vivo. Drug Delivery System, 2019, 34, 186-200.	0.0	0
137	Preparation of Spatio-temporal Functional Surface using Self-oscillating Gel. Hyomen Kagaku, 2007, 28, 647-652.	0.0	0
138	Diffusion Behavior of Water Molecules in Hydrogels with Controlled Network Structure. ECS Meeting Abstracts, 2018, , .	0.0	0
139	Thermodynamic Analysis of Polymer Gel Elasticity. ECS Meeting Abstracts, 2018, , .	0.0	0
140	(Invited) Instantly Formative Hydrogels with Super-Low Polymeric Component. ECS Meeting Abstracts, 2018, , .	0.0	0
141	Similarity between Gel and Semi-Dilute Solution. ECS Meeting Abstracts, 2018, , .	0.0	0
142	Quantitative Evaluation of Homogeneous Hydrogel Surface Wettability. ECS Meeting Abstracts, 2018, , .	0.0	0