P Maarten Biesheuvel

List of Publications by Year
in descending order

143 papers	15,114 citations	22153 59 h-index	17592 121 g-index
145 all docs	145 docs citations	145 times ranked	7041 citing authors

#	Article	IF	Citations
1	Review on the science and technology of water desalination by capacitive deionization. Progress in Materials Science, 2013, 58, 1388-1442.	32.8	1,648
2	Water desalination via capacitive deionization: what is it and what can we expect from it?. Energy and Environmental Science, 2015, 8, 2296-2319.	30.8	1,273
3	Membrane capacitive deionization. Journal of Membrane Science, 2010, 346, 256-262.	8.2	464
4	Direct prediction of the desalination performance of porous carbon electrodes for capacitive deionization. Energy and Environmental Science, 2013, 6, 3700.	30.8	461
5	Energy consumption and constant current operation in membrane capacitive deionization. Energy and Environmental Science, 2012, 5, 9520.	30.8	439
6	Theory of membrane capacitive deionization including the effect of the electrode pore space. Journal of Colloid and Interface Science, 2011, 360, 239-248.	9.4	374
7	Water Desalination Using Capacitive Deionization with Microporous Carbon Electrodes. ACS Applied Materials & Interfaces, 2012, 4, 1194-1199.	8.0	374
8	Charge Efficiency: A Functional Tool to Probe the Double-Layer Structure Inside of Porous Electrodes and Application in the Modeling of Capacitive Deionization. Journal of Physical Chemistry Letters, 2010, 1, 205-210.	4.6	334
9	Produced water treatment by membranes: A review from a colloidal perspective. Journal of Colloid and Interface Science, 2017, 487, 523-534.	9.4	320
10	Energy consumption in membrane capacitive deionization for different water recoveries and flow rates, and comparison with reverse osmosis. Desalination, 2013, 330, 35-41.	8.2	301
11	Optimization of salt adsorption rate in membrane capacitive deionization. Water Research, 2013, 47, 1941-1952.	11.3	276
12	Nonlinear dynamics of capacitive charging and desalination by porous electrodes. Physical Review E, 2010, 81, 031502.	2.1	271
13	Attractive forces in microporous carbon electrodes for capacitive deionization. Journal of Solid State Electrochemistry, 2014, 18, 1365-1376.	2.5	256
14	Carbon flow electrodes for continuous operation of capacitive deionization and capacitive mixing energy generation. Journal of Materials Chemistry A, 2014, 2, 9313.	10.3	233
15	Recent advances in ion selectivity with capacitive deionization. Energy and Environmental Science, 2021, 14, 1095-1120.	30.8	226
16	Nickel Hexacyanoferrate Electrodes for Continuous Cation Intercalation Desalination of Brackish Water. Electrochimica Acta, 2017, 255, 369-378.	5.2	221
17	Diffuse charge and Faradaic reactions in porous electrodes. Physical Review E, 2011, 83, 061507.	2.1	216
18	Time-dependent ion selectivity in capacitive charging of porous electrodes. Journal of Colloid and Interface Science, 2012, 384, 38-44.	9.4	213

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19	Nernst-Planck transport theory for (reverse) electrodialysis: I. Effect of co-ion transport through the membranes. Journal of Membrane Science, 2016, 510, 370-381.	8.2	211
20	Direct Power Production from a Water Salinity Difference in a Membrane-Modified Supercapacitor Flow Cell. Environmental Science & Technology, 2010, 44, 5661-5665.	10.0	204
21	Performance metrics for the objective assessment of capacitive deionization systems. Water Research, 2019, 152, 126-137.	11.3	201
22	Enhanced charge efficiency and reduced energy use in capacitive deionization by increasing the discharge voltage. Journal of Colloid and Interface Science, 2015, 446, 317-326.	9.4	184
23	Complementary surface charge for enhanced capacitive deionization. Water Research, 2016, 92, 275-282.	11.3	176
24	Dynamic Adsorption/Desorption Process Model for Capacitive Deionization. Journal of Physical Chemistry C, 2009, 113, 5636-5640.	3.1	173
25	A prototype cell for extracting energy from a water salinity difference by means of double layer expansion in nanoporous carbon electrodes. Energy and Environmental Science, 2011, 4, 772.	30.8	164
26	Counterion volume effects in mixed electrical double layers. Journal of Colloid and Interface Science, 2007, 316, 490-499.	9.4	161
27	Theory of pH changes in water desalination by capacitive deionization. Water Research, 2017, 119, 178-186.	11.3	160
28	Effect of electrode thickness variation on operation of capacitive deionization. Electrochimica Acta, 2012, 75, 148-156.	5.2	158
29	Resistance identification and rational process design in Capacitive Deionization. Water Research, 2016, 88, 358-370.	11.3	155
30	Adsorption of the Protein Bovine Serum Albumin in a Planar Poly(acrylic acid) Brush Layer As Measured by Optical Reflectometry. Langmuir, 2008, 24, 6575-6584.	3.5	154
31	Thermodynamic cycle analysis for capacitive deionization. Journal of Colloid and Interface Science, 2009, 332, 258-264.	9.4	149
32	Electrostatic Free Energy of Weakly Charged Macromolecules in Solution and Intermacromolecular Complexes Consisting of Oppositely Charged Polymers. Langmuir, 2004, 20, 2785-2791.	3.5	142
33	Fluidized bed electrodes with high carbon loading for water desalination by capacitive deionization. Journal of Materials Chemistry A, 2016, 4, 3642-3647.	10.3	140
34	Current-Induced Membrane Discharge. Physical Review Letters, 2012, 109, 108301.	7.8	134
35	Electrochemistry and capacitive charging of porous electrodes in asymmetric multicomponent electrolytes. Russian Journal of Electrochemistry, 2012, 48, 580-592.	0.9	134
36	Timeline on the application of intercalation materials in Capacitive Deionization. Desalination, 2019, 455, 115-134.	8.2	132

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37	Validity of the Boltzmann equation to describe Donnan equilibrium at the membraneâ€“solution interface. Journal of Membrane Science, 2013, 442, 131-139.	8.2	126
38	Nernst-Planck transport theory for (reverse) electrodialysis: II. Effect of water transport through ion-exchange membranes. Journal of Membrane Science, 2017, 531, 172-182.	8.2	124
39	Theory of Water Desalination by Porous Electrodes with Immobile Chemical Charge. Colloids and Interface Science Communications, 2015, 9, 1-5.	4.1	119
40	Analysis of electrolyte transport through charged nanopores. Physical Review E, 2016, 93, 053108.	2.1	119
41	Design of ceramic membrane supports: permeability, tensile strength and stress. Journal of Membrane Science, 1999, 156, 141-152.	8.2	118
42	Imposed currents in galvanic cells. Electrochimica Acta, 2009, 54, 4857-4871.	5.2	112
43	Polyelectrolyte Brush Amplified Electroactuation of Microcantilevers. Nano Letters, 2008, 8, 725-730.	9.1	109
44	Water Desalination with Wires. Journal of Physical Chemistry Letters, 2012, 3, 1613-1618.	4.6	101
45	Nickel hexacyanoferrate electrodes for high mono/divalent ion-selectivity in capacitive deionization. Desalination, 2020, 481, 114346.	8.2	101
46	Diffuse-charge effects on the transient response of electrochemical cells. Physical Review E, 2010, 81, 021503.	2.1	100
47	Energy consumption in capacitive deionization â€“ Constant current versus constant voltage operation. Water Research, 2018, 143, 367-375.	11.3	93
48	Theory of Cast Formation in Electrophoretic Deposition. Journal of the American Ceramic Society, 1999, 82, 1451-1455.	3.8	92
49	Theory of water treatment by capacitive deionization with redox active porous electrodes. Water Research, 2018, 132, 282-291.	11.3	86
50	A one-dimensional model for water desalination by flow-through electrode capacitive deionization. Desalination, 2017, 415, 8-13.	8.2	82
51	Salt and Water Transport in Reverse Osmosis Membranes: Beyond the Solution-Diffusion Model. Environmental Science & Technology, 2021, 55, 16665-16675.	10.0	82
52	Energy Consumption of Brackish Water Desalination: Identifying the Sweet Spots for Electrodialysis and Reverse Osmosis. ACS ES&T Engineering, 2021, 1, 851-864.	7.6	81
53	A Modified Box Model Including Charge Regulation for Protein Adsorption in a Spherical Polyelectrolyte Brush. Journal of Physical Chemistry B, 2005, 109, 4209-4214.	2.6	78
54	A Modified Poissonâ^'Boltzmann Model Including Charge Regulation for the Adsorption of Ionizable Polyelectrolytes to Charged Interfaces, Applied to Lysozyme Adsorption on Silica. Journal of Physical Chemistry B, 2005, 109, 4172-4180.	2.6	72

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55	In Situ Spatially and Temporally Resolved Measurements of Salt Concentration between Charging Porous Electrodes for Desalination by Capacitive Deionization. Environmental Science & Technology, 2014, 48, 2008-2015.	10.0	65
56	Salt-Induced Swelling-to-Shrinking Transition in Polyelectrolyte Multilayer Capsules. Physical Review Letters, 2006, 97, 188301.	7.8	64
57	Electrostatic free energy of interacting ionizable double layers. Journal of Colloid and Interface Science, 2004, 275, 514-522.	9.4	62
58	Harvesting Energy from CO₂ Emissions. Environmental Science and Technology Letters, 2014, 1, 31-35.	8.7	61
59	Nernst-Planck transport theory for (reverse) electrodialysis: III. Optimal membrane thickness for enhanced process performance. Journal of Membrane Science, 2018, 565, 480-487.	8.2	61
60	Ionizable polyelectrolyte brushes: brush height and electrosteric interaction. Journal of Colloid and Interface Science, 2004, 275, 97-106.	9.4	59
61	Exceptional Water Desalination Performance with Anionâ€Selective Electrodes. Advanced Materials, 2019, 31, e1806937.	21.0	59
62	Cylindrical Cell Model for the Electrostatic Free Energy of Polyelectrolyte Complexes. Langmuir, 2004, 20, 4764-4770.	3.5	58
63	Analysis of ionic conductance of carbon nanotubes. Physical Review E, 2016, 94, 050601.	2.1	57
64	High performance electrochemical saline water desalination using silver and silver-chloride electrodes. Desalination, 2020, 476, 114216.	8.2	57
65	Ion Selectivity in Brackish Water Desalination by Reverse Osmosis: Theory, Measurements, and Implications. Environmental Science and Technology Letters, 2020, 7, 42-47.	8.7	55
66	Tutorial review of reverse osmosis and electrodialysis. Journal of Membrane Science, 2022, 647, 120221.	8.2	55
67	Diffuse Charge Effects in Fuel Cell Membranes. Journal of the Electrochemical Society, 2009, 156, B225.	2.9	53
68	Reversible thermodynamic cycle analysis for capacitive deionization with modified Donnan model. Journal of Colloid and Interface Science, 2018, 512, 522-528.	9.4	53
69	Selective adsorption of nitrate over chloride in microporous carbons. Water Research, 2019, 164, 114885.	11.3	53
70	Semianalytical Continuum Model for Nondilute Neutral and Charged Brushes Including Finite Stretching. Macromolecules, 2008, 41, 6254-6259.	4.8	52
71	Graded membrane supports produced by centrifugal casting of a slightly polydisperse suspension. Chemical Engineering Science, 2001, 56, 3517-3525.	3.8	51
72	Theory of ion transport with fast acid-base equilibrations in bioelectrochemical systems. Physical Review E, 2014, 90, 013302.	2.1	51

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73	Theory of Ion and Water Transport in Reverse-Osmosis Membranes. Physical Review Applied, 2018, 9, .	3.8	51
74	Two-fluid model for the simultaneous flow of colloids and fluids in porous media. Journal of Colloid and Interface Science, 2011, 355, 389-395.	9.4	49
75	Self-consistent field theory of protein adsorption in a non-Gaussian polyelectrolyte brush. Physical Review E, 2006, 73, 011802.	2.1	48
76	Micromechanical Theory for pH-Dependent Polyelectrolyte Multilayer Capsule Swelling. Macromolecules, 2006, 39, 8480-8486.	4.8	46
77	Application of the Charge Regulation Model to Transport of Ions through Hydrophilic Membranes: One-Dimensional Transport Model for Narrow Pores (Nanofiltration). Journal of Colloid and Interface Science, 2002, 251, 131-142.	9.4	43
78	Adsorption of Anionic Surfactants in a Nonionic Polymer Brush: Experiments, Comparison with Mean-Field Theory, and Implications for Brushâ^'Particle Interaction. Langmuir, 2009, 25, 9252-9261.	3.5	40
79	Phase Behavior of Mixtures of Oppositely Charged Nanoparticles:â€‰ Heterogeneous Poissonâ^'Boltzmann Cell Model Applied to Lysozyme and Succinylated Lysozyme. Langmuir, 2006, 22, 1291-1300.	3.5	39
80	Calculation of the Composition Profile of a Functionally Graded Material Produced by Centrifugal Casting. Journal of the American Ceramic Society, 2000, 83, 743-749.	3.8	38
81	Wettability of Amphoteric Surfaces: The Effect of pH and Ionic Strength on Surface Ionization and Wetting. Langmuir, 2018, 34, 15174-15180.	3.5	37
82	Theory of linear sweep voltammetry with diffuse charge: Unsupported electrolytes, thin films, and leaky membranes. Physical Review E, 2017, 95, 033303.	2.1	35
83	Coulometry and Calorimetry of Electric Double Layer Formation in Porous Electrodes. Physical Review Letters, 2017, 119, 166002.	7.8	35
84	Two-section reactor model for autothermal reforming of methane to synthesis gas. AICHE Journal, 2003, 49, 1827-1837.	3.6	34
85	Adsorption of charged and neutral polymer chains on silica surfaces: The role of electrostatics, volume exclusion, and hydrogen bonding. Physical Review E, 2015, 91, 012601.	2.1	34
86	Effect of Protein Adsorption and Ionic Strength on the Equilibrium Partition Coefficient of Ionizable Macromolecules in Charged Nanopores. Journal of Physical Chemistry B, 2004, 108, 17660-17665.	2.6	33
87	Energy from CO2 using capacitive electrodes â€“ Theoretical outline and calculation of open circuit voltage. Journal of Colloid and Interface Science, 2014, 418, 200-207.	9.4	32
88	Capacitive deionization with wire-shaped electrodes. Electrochimica Acta, 2018, 270, 165-173.	5.2	30
89	Modified Poissonâ€“Nernstâ€“Planck theory for ion transport in polymeric electrolytes. Journal of Electrostatics, 2008, 66, 567-573.	1.9	29
90	Energy from CO2 using capacitive electrodes â€“ A model for energy extraction cycles. Journal of Colloid and Interface Science, 2015, 442, 103-109.	9.4	29

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91	Evaluation of instability criterion for bidisperse sedimentation. AICHE Journal, 2001, 47, 45-52.	3.6	28
92	Sedimentationâ€“diffusion equilibrium of binary mixtures of charged colloids including volume effects. Journal of Physics Condensed Matter, 2005, 17, 6337-6352.	1.8	28
93	Direct Correlation between Local Pressure and Fluorescence Output in Mechanoresponsive Polyelectrolyte Brushes. Angewandte Chemie - International Edition, 2011, 50, 9629-9632.	13.8	28
94	Simplifications of the Poissonâ€“Boltzmann Equation for the Electrostatic Interaction of Close Hydrophilic Surfaces in Water. Journal of Colloid and Interface Science, 2001, 238, 362-370.	9.4	27
95	Evidence for charge regulation in the sedimentation of charged colloids. Journal of Physics Condensed Matter, 2004, 16, L499-L504.	1.8	27
96	Carbon nanotube yarns as strong flexible conductive capacitive electrodes. Colloids and Interface Science Communications, 2014, 3, 9-12.	4.1	27
97	Induced-Charge Capacitive Deionization: The Electrokinetic Response of a Porous Particle to an External Electric Field. Physical Review Letters, 2016, 117, 234502.	7.8	27
98	Implications of the Charge Regulation Model for the Interaction of Hydrophilic Surfaces in Water. Langmuir, 2001, 17, 3553-3556.	3.5	25
99	Sedimentation dynamics and equilibrium profiles in multicomponent mixtures of colloidal particles. Journal of Physics Condensed Matter, 2014, 26, 075101.	1.8	25
100	Volume exclusion effects in the ground-state dominance approximation for polyelectrolyte adsorption on charged interfaces. European Physical Journal E, 2005, 16, 353-359.	1.6	24
101	Theory of batchwise centrifugal casting. AICHE Journal, 1998, 44, 1914-1922.	3.6	23
102	Modeling constant voltage electrophoretic deposition from a stirred suspension. AICHE Journal, 2000, 46, 626-631.	3.6	23
103	Comment on Spongeâ€Templated Preparation of High Surface Area Graphene with Ultrahigh Capacitive Deionization Performance. Advanced Functional Materials, 2015, 25, 179-181.	14.9	23
104	Non-Gaussian curvature distribution of actin-propelled biomimetic colloid trajectories. European Biophysics Journal, 2008, 37, 1361-1366.	2.2	22
105	Electrochemical removal of amphoteric ions. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	7.1	21
106	Nanofiltration of complex mixtures: The effect of the adsorption of divalent ions on membrane retention. Desalination, 2022, 527, 115552.	8.2	20
107	Strategies to increase ion selectivity in electrodialysis. Separation and Purification Technology, 2022, 292, 120944.	7.9	19
108	Particle segregation during pressure filtration for cast formation. Chemical Engineering Science, 2000, 55, 2595-2606.	3.8	18

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109	Phase behavior of mixtures of oppositely charged protein nanoparticles at asymmetric charge ratios. Physical Review E, 2006, 73, 041408.	2.1	18
110	Theory of Ion and Water Transport in Electron-Conducting Membrane Pores with p H-Dependent Chemical Charge. Physical Review Applied, 2019, 12, .	3.8	18
111	Theory of Ion and Electron Transport Coupled with Biochemical Conversions in an Electroactive Biofilm. Physical Review Applied, 2019, 12, .	3.8	18
112	The influence of feedwater pH on membrane charge ionization and ion rejection by reverse osmosis: An experimental and theoretical study. Journal of Membrane Science, 2022, 660, 120800.	8.2	18
113	Revisiting Morrison and Osterle 1965: the efficiency of membrane-based electrokinetic energy conversion. Journal of Physics Condensed Matter, 2016, 28, 324001.	1.8	16
114	New parametrization method for salt permeability of reverse osmosis desalination membranes. , 2022, 2, 100010.		16
115	Theory of oil fouling for microfiltration and ultrafiltration membranes in produced water treatment. Journal of Colloid and Interface Science, 2022, 621, 431-439.	9.4	16
116	Application of the Charge Regulation Model to the Colloidal Processing of Ceramics. Langmuir, 2001, 17, 3557-3562.	3.5	14
117	Application of the Charge Regulation Model to the Separation of Ions by Hydrophilic Membranes. Journal of Colloid and Interface Science, 2001, 241, 422-427.	9.4	14
118	Modeling permeate pH in RO membranes by the extended Donnan steric partitioning pore model. Journal of Membrane Science, 2020, 613, 118511.	8.2	14
119	Multicomponent mass transport modeling of water desalination by reverse osmosis including ion pair formation. Journal of Chemical Physics, 2021, 154, 124501.	3.0	12
120	Response of the Osmotic Tensiometer to Varying Temperatures Modeling and Experimental Validation. Soil Science Society of America Journal, 1999, 63, 1571-1579.	2.2	11
121	Surfactant-dependent critical interfacial tension in silicon carbide membranes for produced water treatment. Journal of Colloid and Interface Science, 2020, 571, 222-231.	9.4	11
122	Dynamic Charge Regulation Model for the Electrostatic Forces between Ionizable Materials. Langmuir, 2002, 18, 5566-5571.	3.5	10
123	Comment on â€œCarbon nanotube/graphene composite for enhanced capacitive deionization performanceâ€•by Y. Wimalasiri and L. Zou. Carbon, 2013, 63, 574-575.	10.3	10
124	A novel interconnected fluidised bed for the combined flash pyrolysis of biomass and combustion of char. Chemical Engineering Journal, 1999, 75, 121-130.	12.7	9
125	Tensile stress in a porous medium due to gas expansion. AICHE Journal, 1999, 45, 1322-1328.	3.6	9
126	Compact Formation during Colloidal Isopressing. Journal of the American Ceramic Society, 2002, 85, 1456-1460.	3.8	9

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127	Theory of transport and recovery in microbial electrosynthesis of acetate from <mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML" altimg="si10.svg"><mml:msub><mml:mrow><mml:mi mathvariant="normal">CO</mml:mi></mml:mrow><mml:mn>2</mml:mn></mml:msub></mml:math>. Electrochimica Acta, 2021, 379, 138029.	5.2	9
128	Influence of suspension concentration on cast formation time in pressure filtration. Journal of the European Ceramic Society, 2000, 20, 835-842.	5.7	8
129	Granular flow in a rotating cone partly submerged in a fluidized bed. AICHE Journal, 2000, 46, 499-508.	3.6	7
130	A prototype osmotic tensiometer with polymeric gel grains. European Journal of Soil Science, 2000, 51, 355-364.	3.9	7
131	Shortcut model for water-balanced operation in fuel processor fuel cell systems. Journal of Power Sources, 2004, 138, 156-161.	7.8	7
132	AC-driven electro-osmotic flow in charged nanopores. Europhysics Letters, 2018, 123, 58006.	2.0	7
133	New method for electrochemical ion separation (EIONS) for chloride/nitrate separation using Ag/AgCl electrodes with a cation exchange membrane. Journal of Environmental Chemical Engineering, 2021, 9, 106876.	6.7	6
134	Microdivers to study sedimentation in polydisperse, concentrated colloidal suspensions. AICHE Journal, 2001, 47, 1969-1977.	3.6	5
135	Thermodynamic analysis of direct internal reforming of methane and butane in proton and oxygen conducting fuel cells. Journal of Power Sources, 2008, 185, 1162-1167.	7.8	5
136	Ionic polarisation layers in polymer electrolytes. , 2008, , .		5
137	Electrostatic cooling at electrolyte-electrolyte junctions. Physical Review Research, 2019, 1, .	3.6	5
138	Desalination of Complex Multi-Ionic Solutions by Reverse Osmosis at Different pH Values, Temperatures, and Compositions. ACS Omega, 2021, 6, 19946-19955.	3.5	4
139	Theory of gel expansion to generate electrical energy. Europhysics Letters, 2017, 120, 46002.	2.0	3
140	Rapid Manufacturing of Microlaminates by Centrifugal Injection Casting. Advanced Engineering Materials, 2000, 2, 507-510.	3.5	2
141	Layering of bidisperse charged nanoparticles in sedimentation. Soft Matter, 2020, 16, 4718-4722.	2.7	2
142	Comment on â€œelectrophoretic deposition-mechanisms, myths and materialsâ€•by Y. Fukuda, N. Nagarajan, W. Mekky, Y. Bao, H.-S. Kim and P. S. Nicholson (J. Mater. Sci. 39 (2004) 787). Journal of Materials Science, 2004, 39, 7081-7083.	3.7	1
143	COMMENT TO â€œA theoretical model for salt ion drift due to electric field suitable to seawater desalinationâ€•by V. Bartzis and I.E. Sarris, Desalination 473 (2020) 114163. Desalination, 2020, 474, 114214.	8.2	1