Matthew T Mcdowell

List of Publications by Year
in descending order

111 papers	24,085 citations	22099 59 h-index	42291 92 g-index
114 all docs	114 docs citations	114 times ranked	19745 citing authors

#	Article	IF	Citations
1	Programming Semiconductor Nanowire Composition with Sub-100 nm Resolution via the Geode Process. Nano Letters, 2022, , .	4.5	0
2	Role of Areal Capacity in Determining Short Circuiting of Sulfide-Based Solid-State Batteries. ACS Applied Materials & Interfaces, 2022, 14, 4051-4060.	4.0	35
3	Editorial: Special issue on solid-state battery materials, phenomena, and systems. Current Opinion in Solid State and Materials Science, 2022, 26, 101006.	5.6	0
4	The promise of alloy anodes for solid-state batteries. Joule, 2022, 6, 1418-1430.	11.7	56
5	Stability of FeF₃-Based Sodium-Ion Batteries in Nonflammable Ionic Liquid Electrolytes at Room and Elevated Temperatures. ACS Applied Materials & Interfaces, 2022, 14, 33447-33456.	4.0	5
6	In Situ Characterization of Transformations in Nanoscale Layered Metal Chalcogenide Materials: A Review. ChemNanoMat, 2021, 7, 208-222.	1.5	6
7	Linking void and interphase evolution to electrochemistry in solid-state batteries using operando X-ray tomography. Nature Materials, 2021, 20, 503-510.	13.3	194
8	In Situ and Operando Imaging of the Evolution of Battery Materials and Interfaces. Microscopy and Microanalysis, 2021, 27, 388-388.	0.2	0
9	The Role of Nanoscale Science for Advancing Batteries. Nano Letters, 2021, 21, 6353-6355.	4.5	4
10	In Situ TEM Investigation of the Spontaneous Hollowing of Alloy Anode Nanocrystals. Microscopy and Microanalysis, 2021, 27, 1972-1973.	0.2	0
11	Stack Pressure Measurements to Probe the Evolution of the Lithiumâ€"Solid-State Electrolyte Interface. ACS Energy Letters, 2021, 6, 3261-3269.	8.8	66
12	Stress evolution during cycling of alloy-anode solid-state batteries. Joule, 2021, 5, 2450-2465.	11.7	85
13	Challenges and Opportunities for Fast Charging of Solid-State Lithium Metal Batteries. ACS Energy Letters, 2021, 6, 3734-3749.	8.8	76
14	Melting, Crystallization, and Alloying Dynamics in Nanoscale Bismuth Telluride. Nano Letters, 2021, 21, 8197-8204.	4.5	1
15	Enabling highly reversible sodium metal cycling across a wide temperature range with dual-salt electrolytes. Journal of Materials Chemistry A, 2021, 9, 10992-11000.	5.2	27
16	Understanding the Effects of Alloy Films on the Electrochemical Behavior of Lithium Metal Anodes with Operando Optical Microscopy. Journal of the Electrochemical Society, 2021, 168, 100517.	1.3	10
17	Mechanical behavior of inorganic lithium-conducting solid electrolytes. Journal of Power Sources, 2021, 516, 230672.	4.0	22
18	Preferential growth of crystalline MoS₂ on patterned Ni channels in contact with Au thin films. , 2021, , .		0

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19	How Metallic Protection Layers Extend the Lifetime of NASICON-Based Solid-State Lithium Batteries. Journal of the Electrochemical Society, 2020, 167, 050502.	1.3	43
20	Understanding Transformations in Battery Materials Using in Situ and Operando Experiments: Progress and Outlook. ACS Energy Letters, 2020, 5, 335-345.	8.8	82
21	In Situ Dynamics during Heating of Copper-Intercalated Bismuth Telluride. Matter, 2020, 3, 1246-1262.	5.0	16
22	Toward High-Capacity Battery Anode Materials: Chemistry and Mechanics Intertwined. Chemistry of Materials, 2020, 32, 8755-8771.	3.2	28
23	Nanomechanical measurements shed light on solid-state battery degradation. MRS Bulletin, 2020, 45, 889-890.	1.7	3
24	Unveiling interfacial dynamics and structural degradation of solid electrolytes in a seawater battery system. Journal of Materials Chemistry A, 2020, 8, 21804-21811.	5.2	8
25	Spontaneous and reversible hollowing of alloy anode nanocrystals for stable battery cycling. Nature Nanotechnology, 2020, 15, 475-481.	15.6	68
26	Efficient Low-Temperature Cycling of Lithium Metal Anodes by Tailoring the Solid-Electrolyte Interphase. ACS Energy Letters, 2020, 5, 2411-2420.	8.8	174
27	Porous Metals from Chemical Dealloying for Solid-State Battery Anodes. Chemistry of Materials, 2020, 32, 2461-2469.	3.2	30
28	Challenges in Lithium Metal Anodes for Solid-State Batteries. ACS Energy Letters, 2020, 5, 922-934.	8.8	322
29	The Effect of Temperature and SEI Formation on the Nucleation and Growth of Electrochemically Plated Lithium. ECS Meeting Abstracts, 2020, MA2020-02, 785-785.	0.0	0
30	(Invited) In Situ Investigation of Interface Evolution and Chemo-Mechanics in Batteries. ECS Meeting Abstracts, 2020, MA2020-02, 178-178.	0.0	0
31	In Situ characterization of Reactive Lithium Metal Interfaces in Solid-State Batteries. ECS Meeting Abstracts, 2020, MA2020-02, 974-974.	0.0	0
32	Toward Electrochemical Studies on the Nanometer and Atomic Scales: Progress, Challenges, and Opportunities. ACS Nano, 2019, 13, 9735-9780.	7.3	32
33	Chemo-Mechanical Challenges in Solid-State Batteries. Trends in Chemistry, 2019, 1, 845-857.	4.4	158
34	Distinct Nanoscale Interphases and Morphology of Lithium Metal Electrodes Operating at Low Temperatures. Nano Letters, 2019, 19, 8664-8672.	4.5	141
35	Silicon-Coreâ€"Carbon-Shell Nanoparticles for Lithium-Ion Batteries: Rational Comparison between Amorphous and Graphitic Carbon Coatings. Nano Letters, 2019, 19, 7236-7245.	4.5	75
36	Interphase Morphology between a Solid-State Electrolyte and Lithium Controls Cell Failure. ACS Energy Letters, 2019, 4, 591-599.	8.8	168

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37	Visualizing Chemomechanical Degradation of a Solid-State Battery Electrolyte. ACS Energy Letters, 2019, 4, 1475-1483.	8.8	196
38	The Effect of Nickel on MoS₂ Growth Revealed with <i>in Situ</i> Transmission Electron Microscopy. ACS Nano, 2019, 13, 7117-7126.	7.3	48
39	Scalable Porous Metals from Lithium Alloys. ECS Meeting Abstracts, 2019, , .	0.0	0
40	Low-Temperature Behavior of Lithium Metal Anodes in Carbonate and Ether Electrolytes. ECS Meeting Abstracts, 2019, , .	0.0	0
41	The Role of Metallic Protection Layers in Extending the Stability of Nasicon Electrolytes for Solid-State Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
42	(Invited) In Situ Imaging of Interphase Evolution and Degradation Processes in Solid-State Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
43	(Invited) â€œDecrepitationâ€•and Mechanical Degradation: In Situ Investigation to Understand Chemo-Mechanical Stability in Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
44	Influence of Metal Dopants on MoS2 Crystallization Investigated through in Situ Electron Microscopy. ECS Meeting Abstracts, 2019, , .	0.0	0
45	Understanding Chemo-Mechanical Degradation in High-Capacity Electrode Materials for Beyond-Lithium-Ion Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
46	Interphase Morphology between a Solid-State Electrolyte and Lithium Controls Cell Failure. ECS Meeting Abstracts, 2019, , .	0.0	122
47	Solidâ€State Route for the Synthesis of Scalable, Luminescent Silicon and Germanium Nanocrystals. ChemNanoMat, 2018, 4, 423-429.	1.5	4
48	Dynamic Nanomaterials Phenomena Investigated with in Situ Transmission Electron Microscopy: A <i>Nano Letters</i> Virtual Issue. Nano Letters, 2018, 18, 657-659.	4.5	8
49	Operando Synchrotron Measurement of Strain Evolution in Individual Alloying Anode Particles within Lithium Batteries. ACS Energy Letters, 2018, 3, 349-355.	8.8	32
50	Toward an Atomistic Understanding of Solid-State Electrochemical Interfaces for Energy Storage. Joule, 2018, 2, 2189-2193.	11.7	29
51	Stretched to the Limit for Better Batteries. Joule, 2018, 2, 818-819.	11.7	4
52	Seeded Nanowire and Microwire Growth from Lithium Alloys. Nano Letters, 2018, 18, 4331-4337.	4.5	6
53	Reduction of Aqueous CO₂ to 1-Propanol at MoS₂ Electrodes. Chemistry of Materials, 2018, 30, 4902-4908.	3.2	73
54	Avoiding Fracture in a Conversion Battery Material through Reaction with Larger Ions. Joule, 2018, 2, 1783-1799.	11.7	65

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55	In situ investigation of dynamic processes in materials for energy storage. , 2018, , .		0
56	Distinct nanoscale reaction pathways in a sulfide material for sodium and lithium batteries. Journal of Materials Chemistry A, 2017, 5, 11701-11709.	5.2	51
57	In Situ XPS Investigation of Transformations at Crystallographically Oriented MoS₂ Interfaces. ACS Applied Materials & Interfaces, 2017, 9, 32394-32404.	4.0	141
58	Comparative Study in Acidic and Alkaline Media of the Effects of pH and Crystallinity on the Hydrogen-Evolution Reaction on MoS₂ and MoSe₂. ACS Energy Letters, 2017, 2, 2234-2238.	8.8	78
59	Pulley protection in batteries. Nature, 2017, 549, 37-38.	13.7	3
60	Reversible Tuning of the Surface Plasmon Resonance of Indium Tin Oxide Nanocrystals by Gas-Phase Oxidation and Reduction. Journal of Physical Chemistry C, 2017, 121, 15970-15976.	1.5	10
61	The mechanics of large-volume-change transformations in high-capacity battery materials. Extreme Mechanics Letters, 2016, 9, 480-494.	2.0	101
62	Mechano-Chemical Surface Modification with Cu2S: Inducing Superior Lubricity. Tribology Letters, 2016, 64, 1.	1.2	11
63	Mechanistic insights into chemical and photochemical transformations of bismuth vanadate photoanodes. Nature Communications, 2016, 7, 12012.	5.8	231
64	Si/TiO₂Tandem-Junction Microwire Arrays for Unassisted Solar-Driven Water Splitting. Journal of the Electrochemical Society, 2016, 163, H261-H264.	1.3	25
65	Protection of inorganic semiconductors for sustained, efficient photoelectrochemical water oxidation. Catalysis Today, 2016, 262, 11-23.	2.2	87
66	In Situ Observation of Divergent Phase Transformations in Individual Sulfide Nanocrystals. Nano Letters, 2015, 15, 1264-1271.	4.5	102
67	Stable Solar-Driven Water Oxidation to O₂(g) by Ni-Oxide-Coated Silicon Photoanodes. Journal of Physical Chemistry Letters, 2015, 6, 592-598.	2.1	144
68	The Influence of Structure and Processing on the Behavior of TiO₂ Protective Layers for Stabilization of n-Si/TiO₂/Ni Photoanodes for Water Oxidation. ACS Applied Materials & Interfaces, 2015, 7, 15189-15199.	4.0	114
69	Interface engineering of the photoelectrochemical performance of Ni-oxide-coated n-Si photoanodes by atomic-layer deposition of ultrathin films of cobalt oxide. Energy and Environmental Science, 2015, 8, 2644-2649.	15.6	130
70	Methods for comparing the performance of energy-conversion systems for use in solar fuels and solar electricity generation. Energy and Environmental Science, 2015, 8, 2886-2901.	15.6	196
71	Nanowires for High-Performance Li-Ion Battery Electrodes. RSC Smart Materials, 2014, , 363-399.	0.1	0
72	A pomegranate-inspired nanoscale design for large-volume-change lithium battery anodes. Nature Nanotechnology, 2014, 9, 187-192.	15.6	2,109

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73	Improving lithiumâ€“sulphur batteries through spatial control of sulphur species deposition on a hybrid electrode surface. Nature Communications, 2014, 5, 3943.	5.8	369
74	Full open-framework batteries for stationary energy storage. Nature Communications, 2014, 5, 3007.	5.8	440
75	Improving O2 production of WO3 photoanodes with IrO2 in acidic aqueous electrolyte. Physical Chemistry Chemical Physics, 2014, 16, 3623.	1.3	98
76	Stabilization of n-cadmium telluride photoanodes for water oxidation to O₂(g) in aqueous alkaline electrolytes using amorphous TiO₂ films formed by atomic-layer deposition. Energy and Environmental Science, 2014, 7, 3334-3337.	15.6	111
77	Dry-air-stable lithium silicideâ€“lithium oxide coreâ€“shell nanoparticles as high-capacity prelithiation reagents. Nature Communications, 2014, 5, 5088.	5.8	276
78	Improved Stability of Polycrystalline Bismuth Vanadate Photoanodes by Use of Dual-Layer Thin TiO₂/Ni Coatings. Journal of Physical Chemistry C, 2014, 118, 19618-19624.	1.5	129
79	25th Anniversary Article: Understanding the Lithiation of Silicon and Other Alloying Anodes for Lithiumâ€Ion Batteries. Advanced Materials, 2013, 25, 4966-4985.	11.1	1,233
80	Rice husks as a sustainable source of nanostructured silicon for high performance Li-ion battery anodes. Scientific Reports, 2013, 3, 1919.	1.6	409
81	Demonstration of an Electrochemical Liquid Cell for Operando Transmission Electron Microscopy Observation of the Lithiation/Delithiation Behavior of Si Nanowire Battery Anodes. Nano Letters, 2013, 13, 6106-6112.	4.5	265
82	Self-healing chemistry enables the stable operation of silicon microparticle anodes for high-energy lithium-ion batteries. Nature Chemistry, 2013, 5, 1042-1048.	6.6	1,031
83	Sulphurâ€“TiO2 yolkâ€“shell nanoarchitecture with internal void space for long-cycle lithiumâ€“sulphur batteries. Nature Communications, 2013, 4, 1331.	5.8	1,884
84	In Situ TEM of Two-Phase Lithiation of Amorphous Silicon Nanospheres. Nano Letters, 2013, 13, 758-764.	4.5	680
85	Crab Shells as Sustainable Templates from Nature for Nanostructured Battery Electrodes. Nano Letters, 2013, 13, 3385-3390.	4.5	208
86	Stable Li-ion battery anodes by in-situ polymerization of conducting hydrogel to conformally coat silicon nanoparticles. Nature Communications, 2013, 4, 1943.	5.8	1,138
87	Silicon Nanowire Electrodes for Lithium-Ion Battery Negative Electrodes. , 2013, , 1-68.		2
88	Fracture of crystalline silicon nanopillars during electrochemical lithium insertion. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 4080-4085.	3.3	372
89	Reaction Front Evolution during Electrochemical Lithiation of Crystalline Silicon Nanopillars. Israel Journal of Chemistry, 2012, 52, 1118-1123.	1.0	18
90	Tunable Reaction Potentials in Open Framework Nanoparticle Battery Electrodes for Grid-Scale Energy Storage. ACS Nano, 2012, 6, 1688-1694.	7.3	215

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91	The effect of metallic coatings and crystallinity on the volume expansion of silicon during electrochemical lithiation/delithiation. Nano Energy, 2012, 1, 401-410.	8.2	156
92	Stable cycling of double-walled silicon nanotube battery anodes through solidâ€“electrolyte interphase control. Nature Nanotechnology, 2012, 7, 310-315.	15.6	2,144
93	Studying the Kinetics of Crystalline Silicon Nanoparticle Lithiation with In Situ Transmission Electron Microscopy. Advanced Materials, 2012, 24, 6034-6041.	11.1	529
94	Improving the cycling stability of silicon nanowire anodes with conducting polymer coatings. Energy and Environmental Science, 2012, 5, 7927.	15.6	265
95	Passivation Coating on Electrospun Copper Nanofibers for Stable Transparent Electrodes. ACS Nano, 2012, 6, 5150-5156.	7.3	176
96	A Yolk-Shell Design for Stabilized and Scalable Li-Ion Battery Alloy Anodes. Nano Letters, 2012, 12, 3315-3321.	4.5	1,587
97	Functionalization of silicon nanowire surfaces with metal-organic frameworks. Nano Research, 2012, 5, 109-116.	5.8	63
98	Low-Temperature Self-Catalytic Growth of Tin Oxide Nanocones over Large Areas. ACS Nano, 2011, 5, 5800-5807.	7.3	40
99	Atomic Layer Deposition of Lead Sulfide Quantum Dots on Nanowire Surfaces. Nano Letters, 2011, 11, 934-940.	4.5	84
100	The Effect of Insertion Species on Nanostructured Open Framework Hexacyanoferrate Battery Electrodes. Journal of the Electrochemical Society, 2011, 159, A98-A103.	1.3	386
101	Highly Conductive, Mechanically Robust, and Electrochemically Inactive TiC/C Nanofiber Scaffold for High-Performance Silicon Anode Batteries. ACS Nano, 2011, 5, 8346-8351.	7.3	122
102	Novel Size and Surface Oxide Effects in Silicon Nanowires as Lithium Battery Anodes. Nano Letters, 2011, 11, 4018-4025.	4.5	284
103	Interconnected Silicon Hollow Nanospheres for Lithium-Ion Battery Anodes with Long Cycle Life. Nano Letters, 2011, 11, 2949-2954.	4.5	1,278
104	Anomalous Shape Changes of Silicon Nanopillars by Electrochemical Lithiation. Nano Letters, 2011, 11, 3034-3039.	4.5	364
105	Prelithiated Silicon Nanowires as an Anode for Lithium Ion Batteries. ACS Nano, 2011, 5, 6487-6493.	7.3	471
106	Single Nanostructure Electrochemical Devices for Studying Electronic Properties and Structural Changes in Lithiated Si Nanowires. Advanced Energy Materials, 2011, 1, 894-900.	10.2	54
107	New Nanostructured Li₂S/Silicon Rechargeable Battery with High Specific Energy. Nano Letters, 2010, 10, 1486-1491.	4.5	612
108	Bending and tensile deformation of metallic nanowires. Modelling and Simulation in Materials Science and Engineering, 2008, 16, 045003.	0.8	103

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109	On The Elastic Modulus of Metallic Nanowires. Nano Letters, 2008, 8, 3613-3618.	4.5	147
110	Plastic deformation of pentagonal silver nanowires: Comparison between AFM nanoindentation and atomistic simulations. Physical Review B, 2008, 77, .	1.1	57
111	Challenges for and Pathways toward Li-Metal-Based All-Solid-State Batteries. ACS Energy Letters, 0, , 1399-1404.	8.8	228