

Matthew T Mcdowell

List of Publications by Year in descending order

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111
papers

24,085
citations

22132

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114
docs citations

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times ranked

19745
citing authors

#	ARTICLE	IF	CITATIONS
1	Stable cycling of double-walled silicon nanotube battery anodes through solidâ€“electrolyte interphase control. <i>Nature Nanotechnology</i> , 2012, 7, 310-315.	15.6	2,144
2	A pomegranate-inspired nanoscale design for large-volume-change lithium battery anodes. <i>Nature Nanotechnology</i> , 2014, 9, 187-192.	15.6	2,109
3	Sulphurâ€“TiO ₂ yolkâ€“shell nanoarchitecture with internal void space for long-cycle lithiumâ€“sulphur batteries. <i>Nature Communications</i> , 2013, 4, 1331.	5.8	1,884
4	A Yolk-Shell Design for Stabilized and Scalable Li-Ion Battery Alloy Anodes. <i>Nano Letters</i> , 2012, 12, 3315-3321.	4.5	1,587
5	Interconnected Silicon Hollow Nanospheres for Lithium-Ion Battery Anodes with Long Cycle Life. <i>Nano Letters</i> , 2011, 11, 2949-2954.	4.5	1,278
6	25th Anniversary Article: Understanding the Lithiation of Silicon and Other Alloying Anodes for Lithiumâ€“ion Batteries. <i>Advanced Materials</i> , 2013, 25, 4966-4985.	11.1	1,233
7	Stable Li-ion battery anodes by in-situ polymerization of conducting hydrogel to conformally coat silicon nanoparticles. <i>Nature Communications</i> , 2013, 4, 1943.	5.8	1,138
8	Self-healing chemistry enables the stable operation of silicon microparticle anodes for high-energy lithium-ion batteries. <i>Nature Chemistry</i> , 2013, 5, 1042-1048.	6.6	1,031
9	In Situ TEM of Two-Phase Lithiation of Amorphous Silicon Nanospheres. <i>Nano Letters</i> , 2013, 13, 758-764.	4.5	680
10	New Nanostructured Li ₂ S/Silicon Rechargeable Battery with High Specific Energy. <i>Nano Letters</i> , 2010, 10, 1486-1491.	4.5	612
11	Studying the Kinetics of Crystalline Silicon Nanoparticle Lithiation with In Situ Transmission Electron Microscopy. <i>Advanced Materials</i> , 2012, 24, 6034-6041.	11.1	529
12	Prelithiated Silicon Nanowires as an Anode for Lithium Ion Batteries. <i>ACS Nano</i> , 2011, 5, 6487-6493.	7.3	471
13	Full open-framework batteries for stationary energy storage. <i>Nature Communications</i> , 2014, 5, 3007.	5.8	440
14	Rice husks as a sustainable source of nanostructured silicon for high performance Li-ion battery anodes. <i>Scientific Reports</i> , 2013, 3, 1919.	1.6	409
15	The Effect of Insertion Species on Nanostructured Open Framework Hexacyanoferrate Battery Electrodes. <i>Journal of the Electrochemical Society</i> , 2011, 159, A98-A103.	1.3	386
16	Fracture of crystalline silicon nanopillars during electrochemical lithium insertion. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012, 109, 4080-4085.	3.3	372
17	Improving lithiumâ€“sulphur batteries through spatial control of sulphur species deposition on a hybrid electrode surface. <i>Nature Communications</i> , 2014, 5, 3943.	5.8	369
18	Anomalous Shape Changes of Silicon Nanopillars by Electrochemical Lithiation. <i>Nano Letters</i> , 2011, 11, 3034-3039.	4.5	364

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19	Challenges in Lithium Metal Anodes for Solid-State Batteries. ACS Energy Letters, 2020, 5, 922-934.	8.8	322
20	Novel Size and Surface Oxide Effects in Silicon Nanowires as Lithium Battery Anodes. Nano Letters, 2011, 11, 4018-4025.	4.5	284
21	Dry-air-stable lithium silicide“lithium oxide core“shell nanoparticles as high-capacity prelithiation reagents. Nature Communications, 2014, 5, 5088.	5.8	276
22	Improving the cycling stability of silicon nanowire anodes with conducting polymer coatings. Energy and Environmental Science, 2012, 5, 7927.	15.6	265
23	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
24	Mechanistic insights into chemical and photochemical transformations of bismuth vanadate photoanodes. Nature Communications, 2016, 7, 12012.	5.8	231
25	Challenges for and Pathways toward Li-Metal-Based All-Solid-State Batteries. ACS Energy Letters, 0, , 1399-1404.	8.8	228
26	Tunable Reaction Potentials in Open Framework Nanoparticle Battery Electrodes for Grid-Scale Energy Storage. ACS Nano, 2012, 6, 1688-1694.	7.3	215
27	Crab Shells as Sustainable Templates from Nature for Nanostructured Battery Electrodes. Nano Letters, 2013, 13, 3385-3390.	4.5	208
28	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
29	Visualizing Chemomechanical Degradation of a Solid-State Battery Electrolyte. ACS Energy Letters, 2019, 4, 1475-1483.	8.8	196
30	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
31	Passivation Coating on Electrospun Copper Nanofibers for Stable Transparent Electrodes. ACS Nano, 2012, 6, 5150-5156.	7.3	176
32	Efficient Low-Temperature Cycling of Lithium Metal Anodes by Tailoring the Solid-Electrolyte Interphase. ACS Energy Letters, 2020, 5, 2411-2420.	8.8	174
33	Interphase Morphology between a Solid-State Electrolyte and Lithium Controls Cell Failure. ACS Energy Letters, 2019, 4, 591-599.	8.8	168
34	Chemo-Mechanical Challenges in Solid-State Batteries. Trends in Chemistry, 2019, 1, 845-857.	4.4	158
35	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
36	On The Elastic Modulus of Metallic Nanowires. Nano Letters, 2008, 8, 3613-3618.	4.5	147

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37	Stable Solar-Driven Water Oxidation to O ₂ (g) by Ni-Oxide-Coated Silicon Photoanodes. <i>Journal of Physical Chemistry Letters</i> , 2015, 6, 592-598.	2.1	144
38	In Situ XPS Investigation of Transformations at Crystallographically Oriented MoS ₂ Interfaces. <i>ACS Applied Materials & Interfaces</i> , 2017, 9, 32394-32404.	4.0	141
39	Distinct Nanoscale Interphases and Morphology of Lithium Metal Electrodes Operating at Low Temperatures. <i>Nano Letters</i> , 2019, 19, 8664-8672.	4.5	141
40	Interface engineering of the photoelectrochemical performance of Ni-oxide-coated n-Si photoanodes by atomic-layer deposition of ultrathin films of cobalt oxide. <i>Energy and Environmental Science</i> , 2015, 8, 2644-2649.	15.6	130
41	Improved Stability of Polycrystalline Bismuth Vanadate Photoanodes by Use of Dual-Layer Thin TiO ₂ /Ni Coatings. <i>Journal of Physical Chemistry C</i> , 2014, 118, 19618-19624.	1.5	129
42	Highly Conductive, Mechanically Robust, and Electrochemically Inactive TiC/C Nanofiber Scaffold for High-Performance Silicon Anode Batteries. <i>ACS Nano</i> , 2011, 5, 8346-8351.	7.3	122
43	Interphase Morphology between a Solid-State Electrolyte and Lithium Controls Cell Failure. <i>ECS Meeting Abstracts</i> , 2019, , .	0.0	122
44	The Influence of Structure and Processing on the Behavior of TiO ₂ Protective Layers for Stabilization of n-Si/TiO ₂ /Ni Photoanodes for Water Oxidation. <i>ACS Applied Materials & Interfaces</i> , 2015, 7, 15189-15199.	4.0	114
45	Stabilization of n-cadmium telluride photoanodes for water oxidation to O ₂ (g) in aqueous alkaline electrolytes using amorphous TiO ₂ films formed by atomic-layer deposition. <i>Energy and Environmental Science</i> , 2014, 7, 3334-3337.	15.6	111
46	Bending and tensile deformation of metallic nanowires. <i>Modelling and Simulation in Materials Science and Engineering</i> , 2008, 16, 045003.	0.8	103
47	In Situ Observation of Divergent Phase Transformations in Individual Sulfide Nanocrystals. <i>Nano Letters</i> , 2015, 15, 1264-1271.	4.5	102
48	The mechanics of large-volume-change transformations in high-capacity battery materials. <i>Extreme Mechanics Letters</i> , 2016, 9, 480-494.	2.0	101
49	Improving O ₂ production of WO ₃ photoanodes with IrO ₂ in acidic aqueous electrolyte. <i>Physical Chemistry Chemical Physics</i> , 2014, 16, 3623.	1.3	98
50	Protection of inorganic semiconductors for sustained, efficient photoelectrochemical water oxidation. <i>Catalysis Today</i> , 2016, 262, 11-23.	2.2	87
51	Stress evolution during cycling of alloy-anode solid-state batteries. <i>Joule</i> , 2021, 5, 2450-2465.	11.7	85
52	Atomic Layer Deposition of Lead Sulfide Quantum Dots on Nanowire Surfaces. <i>Nano Letters</i> , 2011, 11, 934-940.	4.5	84
53	Understanding Transformations in Battery Materials Using in Situ and Operando Experiments: Progress and Outlook. <i>ACS Energy Letters</i> , 2020, 5, 335-345.	8.8	82
54	Comparative Study in Acidic and Alkaline Media of the Effects of pH and Crystallinity on the Hydrogen-Evolution Reaction on MoS ₂ and MoSe ₂ . <i>ACS Energy Letters</i> , 2017, 2, 2234-2238.	8.8	78

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55	Challenges and Opportunities for Fast Charging of Solid-State Lithium Metal Batteries. ACS Energy Letters, 2021, 6, 3734-3749.	8.8	76
56	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
57	Reduction of Aqueous CO ₂ to 1-Propanol at MoS ₂ Electrodes. Chemistry of Materials, 2018, 30, 4902-4908.	3.2	73
58	Spontaneous and reversible hollowing of alloy anode nanocrystals for stable battery cycling. Nature Nanotechnology, 2020, 15, 475-481.	15.6	68
59	Stack Pressure Measurements to Probe the Evolution of the Lithiumâ€“Solid-State Electrolyte Interface. ACS Energy Letters, 2021, 6, 3261-3269.	8.8	66
60	Avoiding Fracture in a Conversion Battery Material through Reaction with Larger Ions. Joule, 2018, 2, 1783-1799.	11.7	65
61	Functionalization of silicon nanowire surfaces with metal-organic frameworks. Nano Research, 2012, 5, 109-116.	5.8	63
62	Plastic deformation of pentagonal silver nanowires: Comparison between AFM nanoindentation and atomistic simulations. Physical Review B, 2008, 77, .	1.1	57
63	The promise of alloy anodes for solid-state batteries. Joule, 2022, 6, 1418-1430.	11.7	56
64	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
65	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
66	The Effect of Nickel on MoS ₂ Growth Revealed with <i>in Situ</i> Transmission Electron Microscopy. ACS Nano, 2019, 13, 7117-7126.	7.3	48
67	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
68	Low-Temperature Self-Catalytic Growth of Tin Oxide Nanocones over Large Areas. ACS Nano, 2011, 5, 5800-5807.	7.3	40
69	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
70	Operando Synchrotron Measurement of Strain Evolution in Individual Alloying Anode Particles within Lithium Batteries. ACS Energy Letters, 2018, 3, 349-355.	8.8	32
71	Toward Electrochemical Studies on the Nanometer and Atomic Scales: Progress, Challenges, and Opportunities. ACS Nano, 2019, 13, 9735-9780.	7.3	32
72	Porous Metals from Chemical Dealloying for Solid-State Battery Anodes. Chemistry of Materials, 2020, 32, 2461-2469.	3.2	30

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73	Toward an Atomistic Understanding of Solid-State Electrochemical Interfaces for Energy Storage. <i>Joule</i> , 2018, 2, 2189-2193.	11.7	29
74	Toward High-Capacity Battery Anode Materials: Chemistry and Mechanics Intertwined. <i>Chemistry of Materials</i> , 2020, 32, 8755-8771.	3.2	28
75	Enabling highly reversible sodium metal cycling across a wide temperature range with dual-salt electrolytes. <i>Journal of Materials Chemistry A</i> , 2021, 9, 10992-11000.	5.2	27
76	Si/TiO ₂ Tandem-Junction Microwire Arrays for Unassisted Solar-Driven Water Splitting. <i>Journal of the Electrochemical Society</i> , 2016, 163, H261-H264.	1.3	25
77	Mechanical behavior of inorganic lithium-conducting solid electrolytes. <i>Journal of Power Sources</i> , 2021, 516, 230672.	4.0	22
78	Reaction Front Evolution during Electrochemical Lithiation of Crystalline Silicon Nanopillars. <i>Israel Journal of Chemistry</i> , 2012, 52, 1118-1123.	1.0	18
79	In Situ Dynamics during Heating of Copper-Intercalated Bismuth Telluride. <i>Matter</i> , 2020, 3, 1246-1262.	5.0	16
80	Mechano-Chemical Surface Modification with Cu ₂ S: Inducing Superior Lubricity. <i>Tribology Letters</i> , 2016, 64, 1.	1.2	11
81	Reversible Tuning of the Surface Plasmon Resonance of Indium Tin Oxide Nanocrystals by Gas-Phase Oxidation and Reduction. <i>Journal of Physical Chemistry C</i> , 2017, 121, 15970-15976.	1.5	10
82	Understanding the Effects of Alloy Films on the Electrochemical Behavior of Lithium Metal Anodes with Operando Optical Microscopy. <i>Journal of the Electrochemical Society</i> , 2021, 168, 100517.	1.3	10
83	Dynamic Nanomaterials Phenomena Investigated with in Situ Transmission Electron Microscopy: A Nano Letters Virtual Issue. <i>Nano Letters</i> , 2018, 18, 657-659.	4.5	8
84	Unveiling interfacial dynamics and structural degradation of solid electrolytes in a seawater battery system. <i>Journal of Materials Chemistry A</i> , 2020, 8, 21804-21811.	5.2	8
85	Seeded Nanowire and Microwire Growth from Lithium Alloys. <i>Nano Letters</i> , 2018, 18, 4331-4337.	4.5	6
86	In Situ Characterization of Transformations in Nanoscale Layered Metal Chalcogenide Materials: A Review. <i>ChemNanoMat</i> , 2021, 7, 208-222.	1.5	6
87	Stability of FeF ₃ -Based Sodium-Ion Batteries in Nonflammable Ionic Liquid Electrolytes at Room and Elevated Temperatures. <i>ACS Applied Materials & Interfaces</i> , 2022, 14, 33447-33456.	4.0	5
88	Solid-State Route for the Synthesis of Scalable, Luminescent Silicon and Germanium Nanocrystals. <i>ChemNanoMat</i> , 2018, 4, 423-429.	1.5	4
89	Stretched to the Limit for Better Batteries. <i>Joule</i> , 2018, 2, 818-819.	11.7	4
90	The Role of Nanoscale Science for Advancing Batteries. <i>Nano Letters</i> , 2021, 21, 6353-6355.	4.5	4

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91	Pulley protection in batteries. Nature, 2017, 549, 37-38.	13.7	3
92	Nanomechanical measurements shed light on solid-state battery degradation. MRS Bulletin, 2020, 45, 889-890.	1.7	3
93	Silicon Nanowire Electrodes for Lithium-Ion Battery Negative Electrodes. , 2013, , 1-68.		2
94	Melting, Crystallization, and Alloying Dynamics in Nanoscale Bismuth Telluride. Nano Letters, 2021, 21, 8197-8204.	4.5	1
95	Nanowires for High-Performance Li-Ion Battery Electrodes. RSC Smart Materials, 2014, , 363-399.	0.1	0
96	In Situ and Operando Imaging of the Evolution of Battery Materials and Interfaces. Microscopy and Microanalysis, 2021, 27, 388-388.	0.2	0
97	In Situ TEM Investigation of the Spontaneous Hollowing of Alloy Anode Nanocrystals. Microscopy and Microanalysis, 2021, 27, 1972-1973.	0.2	0
98	In situ investigation of dynamic processes in materials for energy storage. , 2018, , .		0
99	Scalable Porous Metals from Lithium Alloys. ECS Meeting Abstracts, 2019, , .	0.0	0
100	Low-Temperature Behavior of Lithium Metal Anodes in Carbonate and Ether Electrolytes. ECS Meeting Abstracts, 2019, , .	0.0	0
101	The Role of Metallic Protection Layers in Extending the Stability of Nasicon Electrolytes for Solid-State Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
102	(Invited) In Situ Imaging of Interphase Evolution and Degradation Processes in Solid-State Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
103	(Invited) "Decrepitation" and Mechanical Degradation: In Situ Investigation to Understand Chemo-Mechanical Stability in Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
104	Influence of Metal Dopants on MoS2 Crystallization Investigated through in Situ Electron Microscopy. ECS Meeting Abstracts, 2019, , .	0.0	0
105	Understanding Chemo-Mechanical Degradation in High-Capacity Electrode Materials for Beyond-Lithium-Ion Batteries. ECS Meeting Abstracts, 2019, , .	0.0	0
106	Programming Semiconductor Nanowire Composition with Sub-100 nm Resolution via the Geode Process. Nano Letters, 2022, , .	4.5	0
107	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
108	(Invited) In Situ Investigation of Interface Evolution and Chemo-Mechanics in Batteries. ECS Meeting Abstracts, 2020, MA2020-02, 178-178.	0.0	0

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109	In Situ characterization of Reactive Lithium Metal Interfaces in Solid-State Batteries. ECS Meeting Abstracts, 2020, MA2020-02, 974-974.	0.0	0
110	Preferential growth of crystalline MoS ₂ on patterned Ni channels in contact with Au thin films. , 2021, , .		0
111	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