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ESI 中能源领域热点论文信息快报

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ESI 中能源领域热点论文信息快报
——基于 2021 年 9 月更新数据

ESI（Essential Science Indicators）热点论文指近两个月内被引次数高居前千分之一的 SCI 文章，即最近两个月内最受关注的文章。

本期入榜文章是 2021 年 8 月至 9 月两个月内被引次数排名前千分之一的文章，数据更新时间为 2021 年 9 月 27 日。

本期 ESI 发布的能源领域热点论文共计 220 篇，其中首次入榜文章 113 篇。单篇最高被引 514 次，最低被引 9 次。被引 514 次的文章标题为“**Methylammonium Chloride Induces Intermediate Phase Stabilization for Efficient Perovskite Solar Cells**”，发表在 Cell Press 旗下的能源旗舰期刊 *JOULE*（2019 年影响因子 41.248）上。文章的第一作者为韩国能源研究院的 Kim, Minjin，系统地研究了甲基氯化铵(MACI)添加剂在甲眯碘化铅(FAPbl3）钙钛矿中的作用。添加 MACI 制备的薄膜晶粒尺寸增大了 6 倍。有趣的是，在没有退火的情况下，MACI 仅通过阳离子位点取代就能有效地稳定 FAPbl3 中间体的 c 相，从而制造出具有超纯 α 相的高结晶度 FAPbl3 钙钛矿，光致发光寿命增加了 4.3 倍。密度泛函理论(DFT）得出钙钛矿结构的形成与 MACI 的掺入量有关。当添加 40 摩尔%MACl 时优化的太阳能电池获得了 24.02%的最高效率，认证效率为 23.48%。

对 220 篇热点文章进行清洗，利用工具对标题关键词摘要进行分析得到图 1，可以看出，除了在电池、材料等传统能源领域出现了明显聚类外，2020 年以来，在宏观能源政策与环境的影响下，生态足迹（Ecological Footprint，EF)、中国、可再生能源利用成为了研究热点之一；新冠病毒的爆发背景下，covid 也成为了热点之一；石墨烯材料在能源领域的应用也聚集了学者们的目光。

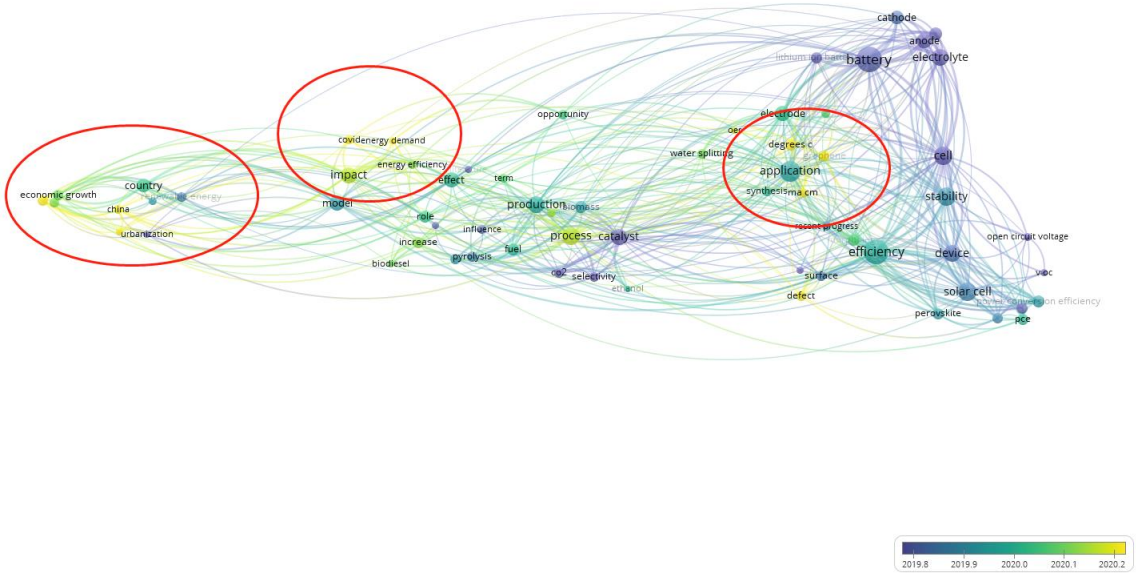

图 1 2020 年 9 月能源领域热点论文聚类分析

首次入榜的文章[1]有：

32.解释电化学储能系统性能用的储能数据报告

38.锂离子电池快速充问题综述

42.含有原子分散的铁活性位点的高性能燃料电池阴极

44.锂离子电池全生命周期劣化关键问题综述

57.电改气的电解和甲烷化现状综述

58.了解电化学 CO2 还原中的阳离子效应

60.使用含氟电解质和非极性溶剂的全温电池

61.利用可见光驱动光催化的共轭聚合物

62.多功能过渡金属磷化物在能量相关电催化中的应用

63.用于增强光催化的金属掺杂 TiO2、非金属掺杂/共掺杂 TiO2 和 TiO2 纳米结构杂化材料的最新进展

65.先进电池管理的状态估计：主要挑战和未来趋势

73.用于析氧反应的羟基（氧）氧化物中活性位点的动态稳定性

75.能源用金属氧化物电极的电化学阻抗谱

[1] 按照被引频次排序，仅列举排名 TOP15 文章，该领域所有热点文章的详细信息请见附表（按文章被引次数排列）。

附表：ESI 中能源领域热点论文列表（2021 年 7 月更新）

注：红色为首次入榜文章，黑色在往期亦是热点文章

序号	题目	第一作者及其单位	期刊及其影响因子[1]	单篇被引
1	Methylammonium Chloride Induces Intermediate Phase Stabilization for Efficient Perovskite Solar Cells	Kim, Minjin； KIER	JOULE;41.248	514
2	Solar cell efficiency tables (version 54)	Green, Martin A.； Univ New South Wales	PROGRESS IN PHOTOVOLTAICS;7.953	419
3	Advances and challenges in understanding the electrocatalytic conversion of carbon dioxide to fuels	Birdja, Yuvraj Y.； Leiden Univ	NATURE ENERGY;60.858	371
4	Issues and opportunities facing aqueous zinc-ion batteries	Tang, Boya； Cent S Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	353
5	Challenges and opportunities towards fast-	Liu, Yayuan； Stanford Univ	NATURE	330

	charging battery materials		ENERGY;60.858	
6	Alkyl Chain Tuning of Small Molecule Acceptors for Efficient Organic Solar Cells	Jiang, Kui； Cent S Univ	JOULE;41.248	326
7	Semiconductor polymeric graphitic carbon nitride photocatalysts: the holy grail for the photocatalytic hydrogen evolution reaction under visible light	Liao, Guangfu； Sun Yat Sen Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	313
8	Over 17% efficiency ternary organic solar cells enabled by two non-fullerene acceptors working in an alloy-like model	Zhan, Lingling； Zhejiang Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	304
9	Recent progress made in the mechanism comprehension and design of electrocatalysts for alkaline water splitting	Hu, Congling； Tianjin Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	302
10	Solar cell efficiency tables (Version 55)	Green, Martin A.； Univ New South Wales	PROGRESS IN PHOTOVOLTAICS;7.953	295

11	Optimal sizing and location based on economic parameters for an off-grid application of a hybrid system with photovoltaic, battery and diesel technology	Cai, Wei] Ningbo Univ Technol, Sch Civil & Transportat Engn, Ningbo 315211, Zhejiang, Peoples R China; Ningbo Univ Technol	ENERGY;7.147	294
12	Monolithic all-perovskite tandem solar cells with 24.8% efficiency exploiting comproportionation to suppress Sn(II) oxidation in precursor ink	Lin, Renxing; Nanjing Univ	NATURE ENERGY;60.858	294
13	Managing grains and interfaces via ligand anchoring enables 22.3%-efficiency inverted perovskite solar cells	Zheng, Xiaopeng; KAUST	NATURE ENERGY;60.858	287
14	Cd-Free Cu(In,Ga)(Se,S)(2) Thin-Film Solar Cell With Record Efficiency of 23.35%	Nakamura, Motoshi; Idemitsu Kosan Co Ltd	IEEE JOURNAL OF PHOTOVOLTAICS;3.887	285
15	Biomass-derived porous carbon materials with different dimensions for supercapacitor electrodes: a review	Bi, Zhihong; Chinese Acad Sci	JOURNAL OF MATERIALS CHEMISTRY A;12.732	255

16	An interface stabilized perovskite solar cell with high stabilized efficiency and low voltage loss	Yoo, Jason J.； MIT	ENERGY & ENVIRONMENTAL SCIENCE;38.532	235
17	A monothiophene unit incorporating both fluoro and ester substitution enabling high-performance donor polymers for non-fullerene solar cells with 16.4% efficiency	Sun, Huiliang； Southern Univ Sci & Technol SUSTech	ENERGY & ENVIRONMENTAL SCIENCE;38.532	223
18	High-energy long-cycling all-solid-state lithium metal batteries enabled by silver-carbon composite anodes	Lee, Yong-Gun； Samsung Elect Co Ltd	NATURE ENERGY;60.858	211
19	Consensus statement for stability assessment and reporting for perovskite photovoltaics based on ISOS procedures	Khenkin, Mark V.； Ben Gurion Univ Negev	NATURE ENERGY;60.858	207
20	A review of lithium ion battery failure mechanisms and fire prevention strategies	Wang, Qingsong； Univ Sci & Technol China	PROGRESS IN ENERGY AND COMBUSTION SCIENCE;29.394	201

21	Selective visible-light-driven photocatalytic CO2 reduction to CH4 mediated by atomically thin CuIn5S8 layers	Li, Xiaodong； Univ Sci & Technol China	NATURE ENERGY;60.858	199
22	High-nickel layered oxide cathodes for lithium-based automotive batteries	Manthiram, Arumugam] Univ Texas Austin, Mat Sci & Engn Program, Austin, TX 78712 USA； Univ Texas Austin	NATURE ENERGY;60.858	198
23	The impact of energy alignment and interfacial recombination on the internal and external open-circuit voltage of perovskite solar cells	Stolterfoht, Martin； Univ Potsdam	ENERGY & ENVIRONMENTAL SCIENCE;38.532	198
24	Hydrogen production for energy: An overview	Dawood, Furat； Murdoch Univ	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	196
25	Scientific Challenges for the Implementation of Zn-Ion Batteries	Blanc, Lauren E.； Univ Waterloo	JOULE;41.248	196
26	Long cycle life and dendrite-free lithium	Weber, Rochelle] Dalhousie Univ,	NATURE	194

	morphology in anode-free lithium pouch cells enabled by a dual-salt liquid electrolyte	Dept Mech Engn, Mat Engn, Halifax, NS, Canada； Dalhousie Univ	ENERGY;60.858	
27	Solar cell efficiency tables (version 56)	Green, Martin A.； Univ New South Wales Sydney	PROGRESS IN PHOTOVOLTAICS;7.953	194
28	Current understanding and challenges of solar-driven hydrogen generation using polymeric photocatalysts	Wang, Yiou； UCL	NATURE ENERGY;60.858	190
29	Trace doping of multiple elements enables stable battery cycling of LiCoO2 at 4.6V	Zhang, Jie-Nan； Chinese Acad Sci	NATURE ENERGY;60.858	186
30	High-energy lithium metal pouch cells with limited anode swelling and long stable cycles	Niu, Chaojiang； Pacific Northwest Natl Lab	NATURE ENERGY;60.858	182
31	Monolithic solid-electrolyte interphases formed in fluorinated orthoformate-based electrolytes minimize Li depletion and pulverization	Cao, Xia； Pacific Northwest Natl Lab	NATURE ENERGY;60.858	182
32	Energy Storage Data Reporting in Perspective-Guidelines for Interpreting the Performance of Electrochemical Energy Storage Systems	Mathis, Tyler S.； Drexel Univ	ADVANCED ENERGY MATERIALS;29.3	180

			68	
33	Manipulating the ion-transfer kinetics and interface stability for high-performance zinc metal anodes	Xie, Xuesong； Cent South Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	178
34	Benchmarking the performance of all-solid-state lithium batteries	Randau, Simon； Justus Liebig Univ Giessen	NATURE ENERGY;60.858	175
35	Impact of renewable energy consumption and financial development on CO2 emissions and economic growth in the MENA region: A panel vector autoregressive (PVAR) analysis	Charfeddine, Lanouar] Qatar Univ, Dept Finance & Econ, Coll Business & Econ, POB 2713, Doha, Qatar；Qatar Univ	RENEWABLE ENERGY;8.001	175
36	Wide-gap non-fullerene acceptor enabling high-performance organic photovoltaic cells for indoor applications	Cui, Yong； Chinese Acad Sci	NATURE ENERGY;60.858	173
37	Expanded hydrated vanadate for high-performance aqueous zinc-ion batteries	Liu, Chaofeng； Univ Washington	ENERGY & ENVIRONMENTAL SCIENCE;38.532	172

38	Lithium-ion battery fast charging: A review	Tomaszewska, Anna； Imperial Coll London	#N/A	171
39	Promoting sustainability through governance of eco-city indicators: a multi-spatial perspective	Deng, Wu； Univ Nottingham Ningbo China	INTERNATIONAL JOURNAL OF LOW-CARBON TECHNOLOGIES; 2.455	168
40	Exceptional performance of hierarchical Ni-Fe oxyhydroxide@NiFe alloy nanowire array electrocatalysts for large current density water splitting	Liang, Caiwu； Tsinghua Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	166
41	Recent Progresses on Defect Passivation toward Efficient Perovskite Solar Cells	Gao, Feng； Chinese Acad Sci	ADVANCED ENERGY MATERIALS;29.368	166
42	High-performance fuel cell cathodes exclusively containing atomically dispersed iron active sites	Zhang, Hanguang； SUNY Buffalo	ENERGY & ENVIRONMENTAL	164

			SCIENCE;38.532	
43	Efficient Organic Solar Cell with 16.88% Efficiency Enabled by Refined Acceptor Crystallization and Morphology with Improved Charge Transfer and Transport Properties	Zhu, Lei； Shanghai Jiao Tong Univ	ADVANCED ENERGY MATERIALS;29.368	159
44	A review on the key issues of the lithium ion battery degradation among the whole life cycle	Han, Xuebing； Tsinghua Univ	#N/A	158
45	A review of deep learning for renewable energy forecasting	Wang, Huaizhi； Shenzhen Univ	ENERGY CONVERSION AND MANAGEMENT;9.709	156
46	A review on feedstocks, production processes, and yield for different generations of biodiesel	Singh, Digambar； Malaviya Natl Inst Technol	FUEL;6.609	150
47	Fine-Tuning Energy Levels via Asymmetric End Groups Enables Polymer Solar Cells with Efficiencies over 17%	Luo, Zhenghui； Hong Kong Univ Sci & Technol	JOULE;41.248	150
48	Recent progress in the synthesis of graphene and	Kumar, Rajesh； Toyohashi Univ	PROGRESS IN	145

	derived materials for next generation electrodes of high performance lithium ion batteries	Technol	ENERGY AND COMBUSTION SCIENCE;29.394	
49	Additive Engineering for Efficient and Stable Perovskite Solar Cells	Zhang, Fei； Natl Renewable Energy Lab	ADVANCED ENERGY MATERIALS;29.368	145
50	Advanced Electrocatalysts for the Oxygen Reduction Reaction in Energy Conversion Technologies	Tian, Xinlong； HUST	JOULE;41.248	141
51	New Phase for Organic Solar Cell Research: Emergence of Y-Series Electron Acceptors and Their Perspectives	Li, Shuixing； Zhejiang Univ	ACS ENERGY LETTERS;23.101	135
52	Covalent-Organic Frameworks: Advanced Organic Electrode Materials for Rechargeable Batteries	Sun, Tao； Nanyang Technol Univ	ADVANCED ENERGY MATERIALS;29.368	135
53	Enabling High-Voltage Lithium-Metal Batteries	Ren, Xiaodi； Pacific Northwest Natl	JOULE;41.248	132

	under Practical Conditions	Lab		
54	Atomically dispersed metal catalysts for the oxygen reduction reaction: synthesis, characterization, reaction mechanisms and electrochemical energy applications	Liu, Minmin； Shanghai Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	132
55	Ligand-assisted cation-exchange engineering for high-efficiency colloidal Cs(1-x)FA(x)PbI(3) quantum dot solar cells with reduced phase segregation	Hao, Mengmeng； Univ Queensland	NATURE ENERGY;60.858	131
56	Advances in two-dimensional organic-inorganic hybrid perovskites	Zhang, Fei； Natl Renewable Energy Lab	ENERGY & ENVIRONMENTAL SCIENCE;38.532	128
57	Power-to-Gas: Electrolysis and methanation status review	Thema, M.； Tech Univ Appl Sci OTH Regensburg	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	127
58	Understanding cation effects in electrochemical	Ringe, Stefan] Stanford Univ, Dept	ENERGY &	127

	CO2 reduction	Chem Engn, SUNCAT Ctr Interface Sci & Catalysis, Stanford, CA 94305 USA； Stanford Univ	ENVIRONMENTAL SCIENCE;38.532	
59	Patent landscape review on biodiesel production: Technology updates	Mahlia, T. M. I.； Univ Technol Sydney	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	126
60	All-temperature batteries enabled by fluorinated electrolytes with non-polar solvents	Fan, Xiulin； Univ Maryland	NATURE ENERGY;60.858	124
61	Conjugated polymers for visible-light-driven photocatalysis	Dai, Chunhui； Natl Univ Singapore	ENERGY & ENVIRONMENTAL SCIENCE;38.532	122
62	Multifunctional Transition Metal-Based Phosphides in Energy-Related Electrocatalysis	Li, Yang； Nankai Univ	ADVANCED ENERGY MATERIALS;29.368	122
63	Recent progress in metal-doped TiO2, non-metal	Basavarajappa, Patil S.；	INTERNATIONA	120

	doped/codoped TiO2 and TiO2 nanostructured hybrids for enhanced photocatalysis	Visuesvaraya Technol Univ	L JOURNAL OF HYDROGEN ENERGY;5.816	
64	Electrolyte design for LiF-rich solid-electrolyte interfaces to enable high-performance microsized alloy anodes for batteries	Chen, Ji； Univ Maryland	NATURE ENERGY;60.858	119
65	State estimation for advanced battery management: Key challenges and future trends	Hu, Xiaosong； Chongqing Univ	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	117
66	Flow regime aspects in determining environmental flows and maximising energy production at run-of-river hydropower plants	Kuriqi, Alban； Univ Lisbon	APPLIED ENERGY;9.746	117
67	Decoupling electrolytes towards stable and high-energy rechargeable aqueous zinc-manganese dioxide batteries	Zhong, Cheng； Tianjin Univ	NATURE ENERGY;60.858	117
68	Determinants of the ecological footprint: Role of renewable energy, natural resources, and	Danis] Guangdong Univ Foreign Studies, Sch Econ & Trade,	SUSTAINABLE CITIES AND	116

	urbanization	Guangzhou 510006, Peoples R China； Guangdong Univ Foreign Studies	SOCIETY;7.587	
69	Recent advancements in PV cooling and efficiency enhancement integrating phase change materials based systems - A comprehensive review	Ali, Hafiz Muhammad] King Fahd Univ Petr & Minerals, Dept Mech Engn, Dhahran 31261, Saudi Arabia；King Fahd Univ Petr & Minerals	SOLAR ENERGY;5.742	115
70	Current status and future directions of multivalent metal-ion batteries	Liang, Yanliang； Univ Houston	NATURE ENERGY;60.858	115
71	All-Small-Molecule Organic Solar Cells with an Ordered Liquid Crystalline Donor	Chen, Haiyan； Univ Chinese Acad Sci UCAS Chongqing	JOULE;41.248	115
72	Recent Advances on Water-Splitting Electrocatalysis Mediated by Noble-Metal-Based Nanostructured Materials	Li, Yingjie； Peking Univ	ADVANCED ENERGY MATERIALS;29.368	115
73	Dynamic stability of active sites in hydr(oxy)oxides for the oxygen evolution reaction	Chung, Dong Young； Argonne Natl Lab	NATURE ENERGY;60.858	114
74	Advanced materials and technologies for hybrid	Afir, Ahmed； Univ Brunei	JOURNAL OF	114

	supercapacitors for energy storage - A review	Darussalam	ENERGY STORAGE;6.583	
75	Electrochemical Impedance Spectroscopy of Metal Oxide Electrodes for Energy Applications	Bredar, Alexandria R. C.； Auburn Univ	ACS APPLIED ENERGY MATERIALS;6.024	110
76	Fluorinated Solid-Electrolyte Interphase in High-Voltage Lithium Metal Batteries	Li, Tao； Tsinghua Univ	JOULE;41.248	109
77	Recent developments in lignocellulosic biomass catalytic fast pyrolysis: Strategies for the optimization of bio-oil quality and yield	Chen, Xu； Huazhong Univ Sci & Technol	FUEL PROCESSING TECHNOLOGY;7.033	108
78	Light-driven methane dry reforming with single atomic site antenna-reactor plasmonic photocatalysts	Zhou, Linan； Rice Univ	NATURE ENERGY;60.858	106
79	Data-driven health estimation and lifetime prediction of lithium-ion batteries: A review	Li, Yi； Univ Lancaster	RENEWABLE & SUSTAINABLE ENERGY	106

			REVIEWS;14.982	
80	Recent progress of surface coating on cathode materials for high-performance lithium-ion batteries	Guan, Peiyuan； Univ New South Wales	JOURNAL OF ENERGY CHEMISTRY;9.676	105
81	High-performance conjugated polymer donor materials for polymer solar cells with narrow-bandgap nonfullerene acceptors	Cui, Chaohua； Soochow Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	105
82	Six-junction III-V solar cells with 47.1% conversion efficiency under 143 Suns concentration	Geisz, John F.； NREL	NATURE ENERGY;60.858	105
83	Interface Engineering of Hierarchical Branched Mo-Doped Ni3S2/NixPy Hollow Heterostructure Nanorods for Efficient Overall Water Splitting	Luo, Xu； Wuhan Univ Technol	ADVANCED ENERGY MATERIALS;29.368	104
84	Institutional quality, green innovation and energy efficiency	Sun, Huaping； Jiangsu Univ	ENERGY POLICY;6.142	104

85	A new forecasting model with wrapper-based feature selection approach using multi-objective optimization technique for chaotic crude oil time series	Karasu, Seckin； Zonguldak Bulent Ecevit Univ	ENERGY;7.147	103
86	Vanadium redox flow batteries: A comprehensive review	Lourenssen, Kyle； Univ Guelph	JOURNAL OF ENERGY STORAGE;6.583	103
87	Antivirus-built environment: Lessons learned from Covid-19 pandemic	Megahed, Naglaa A.] Port Said Univ, Fac Engn, Architecture & Urban Planning Dept, Port Said, Egypt； Port Said Univ	SUSTAINABLE CITIES AND SOCIETY;7.587	103
88	Current and future role of Haber-Bosch ammonia in a carbon-free energy landscape	Smith, Collin； Univ Cambridge	ENERGY & ENVIRONMENTAL SCIENCE;38.532	101
89	Ultrahigh Nitrogen Doping of Carbon Nanosheets for High Capacity and Long Cycling Potassium Ion Storage	Chang, Xingqi； Chinese Acad Sci	ADVANCED ENERGY MATERIALS;29.3	101

			68	
90	Mechanically Robust All-Polymer Solar Cells from Narrow Band Gap Acceptors with Hetero-Bridging Atoms	Fan, Qunping； Chalmers Univ Technol	JOULE;41.248	100
91	Tuning the interlayer spacing of graphene laminate films for efficient pore utilization towards compact capacitive energy storage	Li, Zhuangnan； UCL	NATURE ENERGY;60.858	100
92	From isolated Ti-oxo clusters to infinite Ti-oxo chains and sheets: recent advances in photoactive Ti-based MOFs	Yan, Yu； Zhejiang Sci Tech Univ	JOURNAL OF MATERIALS CHEMISTRY A;12.732	99
93	Mechanical modulations for enhancing energy harvesting: Principles, methods and applications	Zou, Hong-Xiang； Hunan Inst Engn	APPLIED ENERGY;9.746	98
94	Passivating contacts for crystalline silicon solar cells	Allen, Thomas G.； King Abdullah Univ Sci & Technol	NATURE ENERGY;60.858	98
95	Impact of urbanization on CO2 emissions in emerging economy: Evidence from Pakistan	Ali, Rafaqet； COMSATS Univ Islamabad	SUSTAINABLE CITIES AND SOCIETY;7.587	98

96	A review on recent sizing methodologies of hybrid renewable energy systems	Lian, Jijian； Tianjin Univ	ENERGY CONVERSION AND MANAGEMENT;9.709	96
97	Renewable and non-renewable energy consumption-economic growth nexus: New evidence from South Asia	Rahman, Mohammad Mafizur； Univ Southern Queensland	RENEWABLE ENERGY;8.001	95
98	Challenges in Zinc Electrodes for Alkaline Zinc-Air Batteries: Obstacles to Commercialization	Zhao, Zequan； Tianjin Univ	ACS ENERGY LETTERS;23.101	95
99	Promises of Main Group Metal-Based Nanostructured Materials for Electrochemical CO2 Reduction to Formate	Han, Na； Soochow Univ	ADVANCED ENERGY MATERIALS;29.368	94
100	Revisiting the role of renewable and non-renewable energy consumption on Turkey's ecological footprint: Evidence from Quantile ARDL approach	Sharif, Arshian] Univ Utara, Othman Yeop Abdullah Grad Sch Business, Changlun, Malaysia； Univ Utara	SUSTAINABLE CITIES AND SOCIETY;7.587	93

101	The role of oxygen vacancies of ABO(3) perovskite oxides in the oxygen reduction reaction	Ji, Qianqian； Qingdao Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	91
102	Blade-Coated Perovskites on Textured Silicon for 26%-Efficient Monolithic Perovskite/Silicon Tandem Solar Cells	Chen, Bo； Univ N Carolina	JOULE;41.248	90
103	Molecular design for electrolyte solvents enabling energy-dense and long-cycling lithium metal batteries	Yu, Zhiao； Stanford Univ	NATURE ENERGY;60.858	89
104	Electrolysis of low-grade and saline surface water	Tong, Wenming； Natl Univ Ireland Galway	NATURE ENERGY;60.858	89
105	Rational design of two-dimensional nanomaterials for lithium-sulfur batteries	Jana, Milan； Sungkyunkwan Univ SKKU	ENERGY & ENVIRONMENTAL SCIENCE;38.532	88
106	Simultaneous Contact and Grain-Boundary Passivation in Planar Perovskite Solar Cells Using	Zhu, Pengchen； Nanjing Univ	ADVANCED ENERGY	88

	SnO2-KCl Composite Electron Transport Layer		MATERIALS;29.368	
107	Trifluoromethylation Enables a 3D Interpenetrated Low-Band-Gap Acceptor for Efficient Organic Solar Cells	Lai, Hanjian； Southern Univ Sci & Technol	JOULE;41.248	87
108	Facet-dependent active sites of a single Cu2O particle photocatalyst for CO2 reduction to methanol	Wu, Yimin A.； Argonne Natl Lab	NATURE ENERGY;60.858	86
109	A binder-free high silicon content flexible anode for Li-ion batteries	Wang, Hanwei； Zhejiang A&F Univ	ENERGY & ENVIRONMENTAL SCIENCE;38.532	86
110	The efficacy of social distance and ventilation effectiveness in preventing COVID-19 transmission	Sun, Chanjuan] Univ Shanghai Sci & Technol, Sch Environm & Architecture, Shanghai 200093, Peoples R China； Univ Shanghai Sci & Technol	SUSTAINABLE CITIES AND SOCIETY;7.587	86
111	Understanding and applying coulombic efficiency	Xiao, Jie； Pacific Northwest Natl	NATURE	85

	in lithium metal batteries	Lab	ENERGY;60.858	
112	Recent progress in flexible-wearable solar cells for self-powered electronic devices	Hashemi, Seyyed Alireza； Natl Univ Singapore	ENERGY & ENVIRONMENTAL SCIENCE;38.532	84
113	Exceeding 20% efficiency with in situ group V doping in polycrystalline CdTe solar cells	Metzger, W. K.； Natl Renewable Energy Lab	NATURE ENERGY;60.858	83
114	Mitigating Thermal Runaway of Lithium-Ion Batteries	Feng, Xuning； Tsinghua Univ	JOULE;41.248	83
115	A Roadmap to the Ammonia Economy	MacFarlane, Douglas R.； Monash Univ	JOULE;41.248	83
116	Gradient Li-rich oxide cathode particles immunized against oxygen release by a molten salt treatment	Zhu, Zhi； MIT	NATURE ENERGY;60.858	82
117	Realizing high zinc reversibility in rechargeable batteries	Ma, Lin； US Army	NATURE ENERGY;60.858	82
118	The state-of-the-art review on energy harvesting from flow-induced vibrations	Wang, Junlei； Zhengzhou Univ	APPLIED ENERGY;9.746	82

119	The role of in situ generated morphological motifs and Cu(i) species in C2+ product selectivity during CO2 pulsed electroreduction	Aran-Ais, Rosa M.； Max Planck Gesell	NATURE ENERGY;60.858	82
120	Self-Assembled Monolayer Enables Hole Transport Layer-Free Organic Solar Cells with 18% Efficiency and Improved Operational Stability	Lin, Yuanbao； King Abdullah Univ Sci & Technol KAUST	ACS ENERGY LETTERS;23.101	82
121	Evaluating the global potential of aquifer thermal energy storage and determining the potential worldwide hotspots driven by socio-economic, geo-hydrologic and climatic conditions	Lu, Hongwei； North China Elect Power Univ	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	81
122	Thermochemical conversion of sewage sludge: A critical review	Gao, Ningbo； Xi An Jiao Tong Univ	PROGRESS IN ENERGY AND COMBUSTION SCIENCE;29.394	81
123	All-perovskite tandem solar cells with 24.2% certified efficiency and area over 1 cm(2)using surface-anchoring zwitterionic antioxidant	Xiao, Ke； Nanjing Univ	NATURE ENERGY;60.858	80

124	A comprehensive review of energy consumption of seawater reverse osmosis desalination plants	Kim, Jungbin； Korea Univ	APPLIED ENERGY;9.746	80
125	Uncharted Waters: Super-Concentrated Electrolytes	Borodin, Oleg； US Army	JOULE;41.248	79
126	Atomic interface effect of a single atom copper catalyst for enhanced oxygen reduction reactions	Jiang, Zhuoli； Beijing Inst Technol	ENERGY & ENVIRONMENTAL SCIENCE;38.532	79
127	Efficient electrically powered CO2-to-ethanol via suppression of deoxygenation	Wang, Xue； Univ Toronto	NATURE ENERGY;60.858	78
128	Embodied GHG emissions of buildings - The hidden challenge for effective climate change mitigation	Roeck, Martin； Graz Univ Technol	APPLIED ENERGY;9.746	78
129	Iron-based phosphides as electrocatalysts for the hydrogen evolution reaction: recent advances and future prospects	Xu, Siran； Hubei Normal Univ	JOURNAL OF MATERIALS CHEMISTRY A;12.732	78
130	Lignocellulose biomass pyrolysis for bio-oil	Kumar, R.； Macquarie Univ	RENEWABLE &	77

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131	Battery Lifetime Prognostics	Hu, Xiaosong； Chongqing Univ	JOULE;41.248	77
132	Structural transformation of highly active metal-organic framework electrocatalysts during the oxygen evolution reaction	Zhao, Shenlong； Natl Ctr Nanosci & Technol	NATURE ENERGY;60.858	76
133	CCGPA-MPPT: Cauchy preferential crossover-based global pollination algorithm for MPPT in photovoltaic system	Sundararaj, Vinu； Anna Univ	PROGRESS IN PHOTOVOLTAICS;7.953	76
134	Evolution of the Lignin Chemical Structure during the Bioethanol Production Process and Its Inhibition to Enzymatic Hydrolysis	Zhao, Chao； Zhejiang A&F Univ	ENERGY & FUELS;3.605	74
135	Hydrothermal deposition of antimony selenosulfide thin films enables solar cells with 10% efficiency	Tang, Rongfeng； Univ Sci & Technol China	NATURE ENERGY;60.858	71
136	Flexible Perovskite Solar Cells	Jung, Hyun Suk； Sungkyunkwan Univ	JOULE;41.248	71

137	Environmental regulation and green productivity growth: Empirical evidence on the Porter Hypothesis from OECD industrial sectors	Wang, Yun； Dalian Univ Technol	ENERGY POLICY;6.142	71
138	Water-energy-ecosystem nexus: Balancing competing interests at a run-of-river hydropower plant coupling a hydrologic-ecohydraulic approach	Kuriqi, Alban； Univ Lisbon	ENERGY CONVERSION AND MANAGEMENT;9.709	68
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147	Strategic renewable energy resources selection for	Wang, Ying； Nanjing Univ Aeronaut	SUSTAINABLE	62

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149	Technologies and policies to decarbonize global industry: Review and assessment of mitigation drivers through 2070	Rissman, Jeffrey] Energy Innovat LLC, 98 Battery St Ste 202, San Francisco, CA 94111 USA； Energy Innovat LLC	APPLIED ENERGY;9.746	61
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155	Effect of government subsidies on renewable energy investments: The threshold effect	Yang, Xiaolei； China Univ Min & Technol	ENERGY POLICY;6.142	52
156	Over 14% efficiency all-polymer solar cells enabled by a low bandgap polymer acceptor with low energy loss and efficient charge separation	Fan, Qunping； Chalmers Univ Technol	ENERGY & ENVIRONMENTAL SCIENCE;38.532	52
157	Deep learning and medical image processing for coronavirus (COVID-19) pandemic: A survey	Bhattacharya, Sweta； Vellore Inst Technol	SUSTAINABLE CITIES AND	51

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158	Application of graphene in energy storage device - A review	Olabi, A. G.； Univ Sharjah	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	49
159	Assessment of the role of renewable energy consumption and trade policy on environmental degradation using innovation accounting: Evidence from the US	Usman, Ojonugwa] Fed Coll Educ Tech, Sch Business Educ, Potiskum, Yobe State, Nigeria； Fed Coll Educ Tech	RENEWABLE ENERGY;8.001	48
160	Amino acid assisted-synthesis and characterization of magnetically retrievable ZnCo2O4-Co3O4 nanostructures as high activity visible-light-driven photocatalyst	Heidari-Asil, Seyed Ali； Univ Kashan	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	47
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162	A multidimensional measure of energy poverty in China and its impacts on health: An empirical	Zhang, Dayong] Southwestern Univ Finance & Econ, Res Inst Econ &	ENERGY POLICY;6.142	47

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163	Investigation of solar collector system with turbulator considering hybrid nanoparticles	Sheikholeslami, M.； Babol Noshirvani Univ Technol	RENEWABLE ENERGY;8.001	46
164	A novel battery thermal management system using nano-enhanced phase change materials	Jilte, Ravindra] Lovely Profess Univ, Dept Mech Engn, Phagwara 144411, Punjab, India； Lovely Profess Univ	ENERGY;7.147	44
165	Diagnosing and correcting anode-free cell failure via electrolyte and morphological analysis	Louli, A. J.； Dalhousie Univ	NATURE ENERGY;60.858	44
166	Development of biomass derived highly porous fast adsorbents for post-combustion CO2 capture	Sher, Farooq] Coventry Univ, Fac Engn Environm & Comp, Sch Mech Aerosp & Automot Engn, Coventry CV1 2JH, W Midlands, England; Coventry Univ	FUEL;6.609	43
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168	Surface Engineering of Ambient-Air-Processed Cesium Lead Triiodide Layers for Efficient Solar Cells	Yoon, So Me； Ulsan Natl Inst Sci & Technol	JOULE;41.248	43
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171	Impacts of COVID-19 on energy demand and consumption: Challenges, lessons and emerging opportunities	Jiang, Peng] ASTAR, Dept Syst Sci, Inst High Performance Comp, Singapore 138632, Singapore；ASTAR	APPLIED ENERGY;9.746	41
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173	Two-dimensional Ruddlesden-Popper layered perovskite solar cells based on phase-pure thin films	Liang, Chao； Nanjing Tech Univ	NATURE ENERGY;60.858	39
174	Renewable and non-renewable electricity consumption, environmental degradation and economic development: Evidence from Mediterranean countries	Belaid, Fateh] Lille Catholic Univ, Fac Management Econ & Sci, Lille, France； Lille Catholic Univ	ENERGY POLICY;6.142	39
175	Recent advances in energy storage mechanism of aqueous zinc-ion batteries	Chen, Duo； Jilin Univ	JOURNAL OF ENERGY CHEMISTRY;9.676	39
176	Recent advancements in metal-organic frameworks for green applications	Duan, Chongxiong； Foshan Univ	GREEN ENERGY & ENVIRONMENT;8.207	37

177	A magnetron sputtered Mo3Si thin film: an efficient electrocatalyst for N-2 reduction under ambient conditions	Wang, Ting； China West Normal Univ	JOURNAL OF MATERIALS CHEMISTRY A;12.732	36
178	Guidelines for performing lignin-first biorefining	Abu-Omar, Mahdi M.] Univ Calif Santa Barbara, Dept Chem Engn, Santa Barbara, CA 93106 USA; Univ Calif Santa Barbara	ENERGY & ENVIRONMENTAL SCIENCE;38.532	36
179	14.46% Efficiency small molecule organic photovoltaics enabled by the well trade-off between phase separation and photon harvesting	Xu, Chunyu； Beijing Jiaotong Univ	JOURNAL OF ENERGY CHEMISTRY;9.676	36
180	Review of Emerging Concepts in SEI Analysis and Artificial SEI Membranes for Lithium, Sodium, and Potassium Metal Battery Anodes	Liu, Wei] Sichuan Univ, Inst New Energy & Low Carbon Technol INELT, Chengdu 610065, Sichuan, Peoples R China； Sichuan Univ	ADVANCED ENERGY MATERIALS;29.368	36
181	Pyrolysis temperature effect on compositions of basic nitrogen species in Huadian shale oil using	Cui, Da； Northeast Elect Power Univ	JOURNAL OF ANALYTICAL	35

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182	Nexus between energy efficiency and electricity reforms: A DEA-Based way forward for clean power development	Mohsin, Muhammad] Jiangsu Univ, Sch Finance & Econ, Zhenjiang 212013, Jiangsu, Peoples R China; Jiangsu Univ	ENERGY POLICY;6.142	34
183	A review of resource curse burden on inflation in Venezuela	Su, Chi-Wei] Qingdao Univ, Sch Econ, Qingdao, Peoples R China; Qingdao Univ	ENERGY;7.147	34
184	Numerical study on sensitivity analysis of factors influencing liquid cooling with double cold-plate for lithium-ion pouch cell	Patil, Mahesh Suresh; Dong A Univ	INTERNATIONAL JOURNAL OF ENERGY RESEARCH;5.164	34
185	In-situ surface decoration of RuO2 nanoparticles by laser ablation for improved oxygen evolution reaction activity in both acid and alkali solutions	Wang, Zongpeng; Taizhou Univ	JOURNAL OF ENERGY CHEMISTRY;9.676	34
186	Over 17% Efficiency Binary Organic Solar Cells	Qi, Feng; City Univ Hong Kong	ACS ENERGY	34

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187	Intact 2D/3D halide junction perovskite solar cells via solid-phase in-plane growth	Jang, Yeoun-Woo； Seoul Natl Univ	NATURE ENERGY;60.858	33
188	Ecological impacts of run -of -river hydropower plants ? Current status and future prospects on the brink of energy transition	Kuriqi, Alban； Univ Lisbon	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	33
189	Electricity demand during pandemic times: The case of the COVID-19 in Spain	Santiago, I； Univ Cordoba	ENERGY POLICY;6.142	32
190	Interplay between temperature and bandgap energies on the outdoor performance of perovskite/silicon tandem solar cells	Aydin, Erkan； King Abdullah Univ Sci & Technol KAUST	NATURE ENERGY;60.858	31
191	Effect of Sr@ZnO nanoparticles and Ricinus communis biodiesel-diesel fuel blends on modified CRDI diesel engine characteristics	Soudagar, Manzoore Elahi M.； Univ Malaya	ENERGY;7.147	30
192	Carbon quantum dots for advanced electrocatalysis	Tian, Lin； Xuzhou Univ Technol	JOURNAL OF ENERGY	30

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193	A comprehensive overview and recent advances on polyhydroxyalkanoates (PHA) production using various organic waste streams	Saratale, Rijuta Ganesh； Dongguk Univ Seoul	BIORESOURCE TECHNOLOGY;9.642	29
194	Critical review of energy storage systems	Olabi, A. G.； Univ Sharjah	ENERGY;7.147	28
195	Investigating the EKC hypothesis with renewable energy consumption, human capital, globalization and trade openness for China: Evidence from augmented ARDL approach with a structural break	Pata, Ugur Korkut] Osmaniye Korkut Ata Univ, Fac Econ & Adm Sci, Dept Econ, TR-80000 Merkez, Osmaniye, Turkey； Osmaniye Korkut Ata Univ	ENERGY;7.147	28
196	Do economic development and human capital decrease non-renewable energy consumption? Evidence for OECD countries	Alvarado, Rafael； Univ Nacl Loja	ENERGY;7.147	28
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198	Effect of fluoxetine on enhanced biological phosphorus removal using a sequencing batch reactor	Zhao, Jianwei； Qingdao Univ Technol	BIORESOURCE TECHNOLOGY;9.642	28
199	C-, N-Vacancy defect engineered polymeric carbon nitride towards photocatalysis: viewpoints and challenges	Kumar, Abhinandan； Shoolini Univ	JOURNAL OF MATERIALS CHEMISTRY A;12.732	27
200	A deep learning-based social distance monitoring framework for COVID-19	Ahmed, Imran； Inst Management Sci	SUSTAINABLE CITIES AND SOCIETY;7.587	26
201	Ternary Organic Photovoltaic Cells Exhibiting 17.59% Efficiency with Two Compatible Y6 Derivations as Acceptor	Wang, Xuelin； Beijing Jiaotong Univ	SOLAR RRL;8.582	25
202	Analyzing nonlinear impact of economic growth drivers on CO2 emissions: Designing an SDG framework for India	Shahbaz, Muhammad] Beijing Inst Technol, Sch Management & Econ, Dept Int Trade & Finance, Beijing, Peoples R China； Beijing Inst Technol	ENERGY POLICY;6.142	24

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205	16% efficiency all-polymer organic solar cells enabled by a finely tuned morphology via the design of ternary blend	Liu, Tao； Shandong Normal Univ	JOULE;41.248	22
206	Strategies to suppress hydrogen evolution for highly selective electrocatalytic nitrogen reduction: challenges and perspectives	Ren, Yongwen； Dalian Univ Technol	ENERGY & ENVIRONMENTAL SCIENCE;38.532	22
207	Does financial inclusion, renewable and non-renewable energy utilization accelerate ecological footprints and economic growth? Fresh evidence from 15 highest emitting countries	Usman, Muhammad； Govt Coll Univ	SUSTAINABLE CITIES AND SOCIETY;7.587	22

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212	Lignocellulosic biomass as sustainable feedstock and materials for power generation and energy	Wang, Fangqian； Tsinghua Univ	JOURNAL OF ENERGY	15

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214	Fine-tuning of side-chain orientations on nonfullerene acceptors enables organic solar cells with 17.7% efficiency	Chai, Gaoda； Hong Kong Univ Sci & Technol	ENERGY & ENVIRONMENTAL SCIENCE;38.532	14
215	Understanding the calendering processability of Li(Ni0.33Mn0.33Co (0.33))O-2-based cathodes	Primo, Emiliano N.； Univ Picardie Jules Verne	JOURNAL OF POWER SOURCES;9.127	14
216	Bifunctional single-molecular heterojunction enables completely selective CO2-to-CO conversion integrated with oxidative 3D nano-polymerization	Ma, Dong-Dong； Chinese Acad Sci	ENERGY & ENVIRONMENTAL SCIENCE;38.532	14
217	Melting heat transportation in radiative flow of	Khan, Sohail A.； Quaid I Azam	RENEWABLE &	13

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219	The future of hydropower? A systematic review of the drivers, benefits and governance dynamics of transboundary dams	Llamosas, Cecilia； Univ Sussex	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	11
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