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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 2022 年 1 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 11 月至 2022 年 1 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 2022 年 2 月 19 日。

本期 ESI 发布的能源领域热点论文共计 173 篇，其中有 37 篇文章来自于期刊 *NATURE ENERGY*（2020 年影响因子 60.858），20 篇文章来自杂志 *JOULE*（2020 年影响因子 41.248）。本期首次入榜文章 129 篇。单篇最高被引 473 次，文章标题为“**Issues and opportunities facing aqueous zinc-ion batteries**”，发表在英国皇家学会期刊 *ENERGY & ENVIRONMENTAL SCIENCE*（2020 年影响因子 38.532）上。文章的作者为中南大学材料科学与工程学梁叔全教授、周江特聘教授团队，该综述分析了水系锌离子电池电极材料和电解质优化中存在的系列问题，提出了性能提升相关策略

首次入榜的文章[1]有:

13.最大限度地减少与 COVID-19 相关的当前和未来的塑料废物，能源和环境足迹

16.有机太阳能电池研究的新阶段：Y 系列电子受体的出现及其展望

30.燃料电池用铂及铂基电催化剂的研究进展

35.钙钛矿型单结和单片串联太阳电池的无损界面共形单层接触

36.将电解液分离为稳定的高能可充电水性锌锰电池

38.转换效率为 47.1%的六结 III-V 太阳电池

[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 11 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（2020 年）	单篇被引
1	Issues and opportunities facing aqueous zinc-ion batteries	Tang, Boya; Cent S Univ, Sch Mat Sci & Engn, Changsha 410083, Hunan, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	473
2	Alkyl Chain Tuning of Small Molecule Acceptors for Efficient Organic Solar Cells	Jiang, Kui; Cent S Univ, Coll Chem & Chem Engn, Changsha 410083, Hunan, Peoples R China	JOULE;41.248	401
3	Managing grains and interfaces via ligand anchoring enables 22.3%-efficiency inverted perovskite solar cells	Zheng, Xiaopeng; KAUST, Div Phys Sci & Engn, Thuwal, Saudi Arabia	NATURE ENERGY;60.858	399
4	Cd-Free Cu(In,Ga)(Se,S)(2) Thin-Film Solar Cell With Record Efficiency of 23.35%	Nakamura, Motoshi; Idemitsu Kosan Co Ltd, Adv Technol Res Labs, Atsugi, Kanagawa 2430206, Japan	IEEE JOURNAL OF PHOTOVOLTAICS;3.887	393
5	Over 17% efficiency ternary organic solar cells enabled by two non-fullerene acceptors working in an alloy-like model	Zhan, Lingling; Zhejiang Univ, Dept Polymer Sci & Engn, MOE Key Lab Macromol Synth & Functionalizat, State Key Lab Silicon Mat, Hangzhou 310027, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	381
6	Hydrogen production for energy: An overview	Dawood, Furat; Murdoch Univ, Coll Sci Hlth Engn & Educ, Perth, WA, Australia	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	312
7	Scientific Challenges for the Implementation of Zn-Ion Batteries	Blanc, Lauren E.; Univ Waterloo, Dept Chem, Joint Ctr Energy Storage Res,	JOULE;41.248	307

		Waterloo, ON N2L 3G1, Canada		
8	High-nickel layered oxide cathodes for lithium-based automotive batteries	Li, Wangda; Univ Texas Austin, Mat Sci & Engn Program, Austin, TX 78712 USA	NATURE ENERGY;60.858	303
9	High-energy long-cycling all-solid-state lithium metal batteries enabled by silver-carbon composite anodes	Lee, Yong-Gun; Samsung Elect Co Ltd, SAIT, Suwon, South Korea	NATURE ENERGY;60.858	296
10	Consensus statement for stability assessment and reporting for perovskite photovoltaics based on ISOS procedures	Khenkin, Mark V.; Ben Gurion Univ Negev, Swiss Inst Dryland Environm & Energy Res, J Blaustein Inst Desert Res, Dept Solar Energy & Environm Phys, Midreshet Ben Gurion, Israel	NATURE ENERGY;60.858	281
11	Exceptional performance of hierarchical Ni-Fe oxyhydroxide@NiFe alloy nanowire array electrocatalysts for large current density water splitting	Liang, Caiwu; Tsinghua Univ, Shenzhen Int Grad Sch, Div Energy & Environm, Shenzhen 518055, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	265
12	Manipulating the ion-transfer kinetics and interface stability for high-performance zinc metal anodes	Xie, Xuesong; Cent South Univ, Sch Mat Sci & Engn, Changsha 410083, Hunan, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	254
13	Minimising the present and future plastic waste, energy and environmental footprints related to COVID-19	Klemes, Jiri Jaromir; Brno Univ Technol VUT Brno, Fac Mech Engn, NETME Ctr, Sustainable Proc Integrat Lab SPIL, Tech 2896-2, Brno 61669, Czech Republic	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	240
14	A review of energy storage types, applications and recent developments	Koohi-Fayegh, S.; Univ Ontario Inst Technol, Fac Engn & Appl Sci, 2000 Simcoe St North, Oshawa, ON L1H 7K4, Canada	JOURNAL OF ENERGY STORAGE;6.583	238
15	Benchmarking the performance of all-solid-state lithium batteries	Randau, Simon; Justus Liebig Univ Giessen, Inst Phys Chem, Giessen,	NATURE ENERGY;60.858	229

		Germany		
16	New Phase for Organic Solar Cell Research: Emergence of Y-Series Electron Acceptors and Their Perspectives	Li, Shuixing; Zhejiang Univ, State Key Lab Silicon Mat, MOE Key Lab Macromol Synth & Functionalizat, Dept Polymer Sci & Engn, Hangzhou 310027, Peoples R China	ACS ENERGY LETTERS;23.101	227
17	Solar cell efficiency tables (version 56)	Green, Martin A.; Univ New South Wales Sydney, Australian Ctr Adv Photovolta, Sch Photovolta & Renewable Energy Engn, Kensington, NSW 2052, Australia	PROGRESS IN PHOTOVOLTAICS;7.953	218
18	Advanced Electrocatalysts for the Oxygen Reduction Reaction in Energy Conversion Technologies	Tian, Xinlong; HUST, Sch Chem & Chem Engn, 1037 Luoyu Rd, Wuhan 430074, Peoples R China	JOULE;41.248	213
19	Non-fullerene acceptors with branched side chains and improved molecular packing to exceed 18% efficiency in organic solar cells	Li, Chao; Beihang Univ, Sch Chem, Beijing, Peoples R China	NATURE ENERGY;60.858	204
20	Additive Engineering for Efficient and Stable Perovskite Solar Cells	Zhang, Fei; Natl Renewable Energy Lab, Chem & Nanosci Ctr, Golden, CO 80401 USA	ADVANCED ENERGY MATERIALS;29.368	198
21	Fine-Tuning Energy Levels via Asymmetric End Groups Enables Polymer Solar Cells with Efficiencies over 17%	Luo, Zhenghui; Hong Kong Univ Sci & Technol, Shenzhen Res Inst, 9 Yuexing First RD,Hitech Pk, Shenzhen 518057, Peoples R China	JOULE;41.248	191
22	Current status and future directions of multivalent metal-ion batteries	Liang, Yanliang; Univ Houston, Dept Elect & Comp Engn, Houston, TX 77004 USA	NATURE ENERGY;60.858	191
23	Covalent-Organic Frameworks: Advanced Organic	Sun, Tao; Nanyang Technol Univ, Sch	ADVANCED ENERGY	190

	Electrode Materials for Rechargeable Batteries	Mat Sci & Engn, Singapore 639798, Singapore	MATERIALS;29.368	
24	A review on feedstocks, production processes, and yield for different generations of biodiesel	Singh, Digambar; Malaviya Natl Inst Technol, Dept Mech Engn, JLN Marg, Jaipur 302017, Rajasthan, India	FUEL;6.609	188
25	Advances in two-dimensional organic-inorganic hybrid perovskites	Zhang, Fei; Natl Renewable Energy Lab, Chem & Nanosci Ctr, Golden, CO 80401 USA	ENERGY & ENVIRONMENTAL SCIENCE;38.532	183
26	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, KAUST Solar Ctr KSC, Thuwal 23955, Saudi Arabia	ACS ENERGY LETTERS;23.101	177
27	Determinants of the ecological footprint: Role of renewable energy, natural resources, and urbanization	Danis; Guangdong Univ Foreign Studies, Sch Econ & Trade, Guangzhou 510006, Peoples R China	SUSTAINABLE CITIES AND SOCIETY;7.587	171
28	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	SOLAR ENERGY;5.742	170
29	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	SUSTAINABLE CITIES AND SOCIETY;7.587	168
30	Current progress of Pt and Pt-based electrocatalysts used for fuel cells	Ren, Xuefeng; Dalian Univ Technol, Sch Ocean Sci & Technol, Panjin 124221, Peoples R China	SUSTAINABLE ENERGY & FUELS;6.367	167
31	Recent progress in metal-doped TiO2, non-metal doped/codoped TiO2 and TiO2 nanostructured hybrids for enhanced photocatalysis	Basavarajappa, Patil S.; Visuesvaraya Technol Univ, Siddaganga Inst Technol, Dept Chem, Belagavi 560003, Tumakuru, India	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	167

32	Dynamic stability of active sites in hydr(oxy)oxides for the oxygen evolution reaction	Chung, Dong Young; Argonne Natl Lab, Mat Sci Div, Lemont, IL 60439 USA	NATURE ENERGY;60.858	167
33	Structural transformation of highly active metal-organic framework electrocatalysts during the oxygen evolution reaction	Zhao, Shenlong; Natl Ctr Nanosci & Technol, CAS Ctr Excellence Nanosci, CAS Key Lab Nanosyst & Hierarch Fabricat, Beijing, Peoples R China	NATURE ENERGY;60.858	162
34	Recent Development of Ni/Fe-Based Micro/Nanostructures toward Photo/Electrochemical Water Oxidation	Gao, Rui; Beijing Normal Univ, Coll Chem, Beijing Key Lab Energy Convers & Storage Mat, Beijing 100875, Peoples R China	ADVANCED ENERGY MATERIALS;29.368	162
35	Conformal monolayer contacts with lossless interfaces for perovskite single junction and monolithic tandem solar cells	Al-Ashouri, Amran; Helmholtz Zentrum Berlin, Young Investigator Grp Perovskite Tandem Solar Ce, Kekulestr 5, D-12489 Berlin, Germany	ENERGY & ENVIRONMENTAL SCIENCE;38.532	161
36	Decoupling electrolytes towards stable and high-energy rechargeable aqueous zinc-manganese dioxide batteries	Zhong, Cheng; Tianjin Univ, Sch Mat Sci & Engn, Tianjin Key Lab Composite & Funct Mat, Key Lab Adv Ceram & Machining Technol,Minist Educ, Tianjin, Peoples R China	NATURE ENERGY;60.858	156
37	Current and future role of Haber-Bosch ammonia in a carbon-free energy landscape	Smith, Collin; Univ Cambridge, Dept Chem Engn & Biotechnol, Philippa Fawcett Dr, Cambridge CB3 0AS, England	ENERGY & ENVIRONMENTAL SCIENCE;38.532	156
38	Six-junction III-V solar cells with 47.1% conversion efficiency under 143 Suns concentration	Geisz, John F.; NREL, Golden, CO 80401 USA	NATURE ENERGY;60.858	155
39	Interface Engineering of Hierarchical Branched Mo-Doped Ni3S2/NixPy Hollow Heterostructure	Luo, Xu; Wuhan Univ Technol, State Key Lab Adv Technol Mat Synth & Proc,	ADVANCED ENERGY MATERIALS;29.368	155

	Nanorods for Efficient Overall Water Splitting	Wuhan 430070, Peoples R China		
40	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, Coll Engn & Appl Sci, Collaborat Innovat Ctr Adv Microstruct, Natl Lab Solid State Microstruct,Jiangsu Key Lab, Nanjing, Peoples R China	NATURE ENERGY;60.858	155
41	Fluorinated Solid-Electrolyte Interphase in High-Voltage Lithium Metal Batteries	Li, Tao; Tsinghua Univ, Dept Chem Engn, Beijing Key Lab Green Chem React Engn & Technol, Beijing 100084, Peoples R China	JOULE;41.248	154
42	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	ENERGY;7.147	153
43	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, Dept Elect Elect Engn, TR-67100 Zonguldak, Turkey	ENERGY;7.147	153
44	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	SUSTAINABLE CITIES AND SOCIETY;7.587	151
45	Antivirus-built environment: Lessons learned from Covid-19 pandemic	Megahed, Naglaa A.; Port Said Univ, Fac Engn, Architecture & Urban Planning Dept, Port Said, Egypt	SUSTAINABLE CITIES AND SOCIETY;7.587	150
46	Molecular design for electrolyte solvents enabling energy-dense and long-cycling lithium metal batteries	Yu, Zhiao; Stanford Univ, Dept Chem Engn, Stanford, CA 94305 USA	NATURE ENERGY;60.858	148
47	Passivating contacts for crystalline silicon solar cells	Allen, Thomas G.; King Abdullah Univ Sci & Technol, KSC, Thuwal, Saudi Arabia	NATURE ENERGY;60.858	144

48	Tuning the interlayer spacing of graphene laminate films for efficient pore utilization towards compact capacitive energy storage	Li, Zhuangnan; UCL, Dept Chem, London, England	NATURE ENERGY;60.858	144
49	A review on the complementarity of renewable energy sources: Concept, metrics, application and future research directions	Juras, J.; Malardalen Univ, Future Energy Ctr, Sch Business Soc & Engn, S-72123 Vasteras, Sweden	SOLAR ENERGY;5.742	143
50	Institutional quality, green innovation and energy efficiency	Sun, Huaping; Jiangsu Univ, Inst Ind Econ, Zhenjiang 212013, Jiangsu, Peoples R China	ENERGY POLICY;6.142	142
51	Mechanically Robust All-Polymer Solar Cells from Narrow Band Gap Acceptors with Hetero-Bridging Atoms	Fan, Qunping; Chalmers Univ Technol, Dept Chem & Chem Engn, SE-41296 Gothenburg, Sweden	JOULE;41.248	141
52	Realizing high zinc reversibility in rechargeable batteries	Ma, Lin; US Army, Energy Storage Branch, Energy & Biotechnol Div, Sensor & Electron Devices Directorate,Res Lab, Adelphi, MD 20783 USA	NATURE ENERGY;60.858	141
53	Hydrogen as an energy vector	Abdin, Zainul; Monash Univ, Fac Informat Technol, Melbourne, Vic 3145, Australia	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	140
54	The state-of-the-art review on energy harvesting from flow-induced vibrations	Wang, Junlei; Zhengzhou Univ, Sch Mech & Power Engn, Zhengzhou 450000, Peoples R China	APPLIED ENERGY;9.746	139
55	A Roadmap to the Ammonia Economy	MacFarlane, Douglas R.; Monash Univ, Sch Chem, ARC Ctr Excellence Electromat Sci, Clayton, Vic 3800, Australia	JOULE;41.248	139
56	The role of oxygen vacancies of ABO(3) perovskite	Ji, Qianqian; Qingdao Univ, Inst Mat	ENERGY &	136

	oxides in the oxygen reduction reaction	Energy & Environm, Coll Mat Sci & Engn, Qingdao, Peoples R China	ENVIRONMENTAL SCIENCE;38.532	
57	Self-assembled Ti3C2 MXene and N-rich porous carbon hybrids as superior anodes for high-performance potassium-ion batteries	Zhao, Ruizheng; Shandong Univ, Key Lab Liquid Solid Struct Evolut & Proc Mat, Minist Educ, Sch Mat Sci & Engn, Jinan 250061, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	136
58	Recycling End-of-Life Electric Vehicle Lithium-Ion Batteries	Chen, Mengyuan; Worcester Polytech Inst, Dept Mech Engn, Worcester, MA 01609 USA	JOULE;41.248	135
59	Electrolysis of low-grade and saline surface water	Tong, Wenming; Natl Univ Ireland Galway, Sch Chem, Galway, Ireland	NATURE ENERGY;60.858	134
60	Triboelectric Nanogenerator (TENG)-Sparking an Energy and Sensor Revolution	Wang, Zhong Lin; Chinese Acad Sci, Beijing Inst Nanoenergy & Nanosyst, Beijing 100083, Peoples R China	ADVANCED ENERGY MATERIALS;29.368	131
61	Understanding and applying coulombic efficiency in lithium metal batteries	Xiao, Jie; Pacific Northwest Natl Lab, Energy & Environm Directorate, Richland, WA 99352 USA	NATURE ENERGY;60.858	131
62	Electric vehicles standards, charging infrastructure, and impact on grid integration: A technological review	Das, H. S.; Univ Alabama, Dept Elect & Comp Engn, Tuscaloosa, AL 35401 USA	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	128
63	Challenges and solution technologies for the integration of variable renewable energy sources-a review	Sinsel, Simon R.; Swiss Fed Inst Technol Zurich ETH Zurich, Dept Management Technol & Econ, Grp Sustainabil & Technol, Weinbergstr 56-58, CH-8092 Zurich, Switzerland	RENEWABLE ENERGY;8.001	125
64	The success story of graphite as a lithium-ion anode material - fundamentals, remaining challenges, and	Asenbauer, Jakob; Helmholtz Inst Ulm HIU, Helmholtzstr 11, D-89081 Ulm,	SUSTAINABLE ENERGY & FUELS;6.367	125

	recent developments including silicon (oxide) composites	Germany		
65	A review of the current knowledge and challenges of hydrothermal carbonization for biomass conversion	Heidari, Mohammad; Univ Guelph, Sch Engn, Mech Engn Program, Guelph, ON N1G 2W1, Canada	JOURNAL OF THE ENERGY INSTITUTE;6.186	125
66	Design of low bandgap tin-lead halide perovskite solar cells to achieve thermal, atmospheric and operational stability	Prasanna, Rohit; Stanford Univ, Mat Sci & Engn, Stanford, CA 94305 USA	NATURE ENERGY;60.858	123
67	A binder-free high silicon content flexible anode for Li-ion batteries	Wang, Hanwei; Zhejiang A&F Univ, Sch Engn, Hangzhou 311300, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	123
68	Effect of solid-H2S gas reactions on CZTSSe thin film growth and photovoltaic properties of a 12.62% efficiency device	Son, Dae-Ho; Daegu Gyeongbuk Inst Sci & Technol, Div Energy Technol, 333 Techno Jungang Daero, Daegu 42988, South Korea	JOURNAL OF MATERIALS CHEMISTRY A;12.732	122
69	Strategies toward High-Loading Lithium-Sulfur Battery	Hu, Yin; Univ Elect Sci & Technol China, State Key Lab Elect Thin Films & Integrated Devic, Chengdu 610054, Peoples R China	ADVANCED ENERGY MATERIALS;29.368	122
70	Iron-based phosphides as electrocatalysts for the hydrogen evolution reaction: recent advances and future prospects	Xu, Siran; Hubei Normal Univ, Coll Chem & Chem Engn, Huangshi 435002, Hubei, Peoples R China	JOURNAL OF MATERIALS CHEMISTRY A;12.732	121
71	Thermoelectric cooler and thermoelectric generator devices: A review of present and potential applications, modeling and materials	Pourkiaei, Seyed Mohsen; Univ Tehran, Dept Renewable Energy & Environm Engn, Tehran, Iran	ENERGY;7.147	120
72	Battery Lifetime Prognostics	Hu, Xiaosong; Chongqing Univ, Dept Automot Engn, State Key Lab Mech	JOULE;41.248	117

		Transmiss, Chongqing 400044, Peoples R China		
73	Energy management of hybrid electric vehicles: A review of energy optimization of fuel cell hybrid power system based on genetic algorithm	Lu, Xueqin; Shanghai Univ Elect Power, Sch Automat Engn, Shanghai 200090, Peoples R China	ENERGY CONVERSION AND MANAGEMENT;9.709	116
74	Hydrothermal deposition of antimony selenosulfide thin films enables solar cells with 10% efficiency	Tang, Rongfeng; Univ Sci & Technol China, Hefei Natl Lab Phys Sci Microscale, CAS Key Lab Mat Energy Convers, Dept Mat Sci & Engn,Sch Chem & Mat Sci, Hefei, Peoples R China	NATURE ENERGY;60.858	114
75	CCGPA-MPPT: Cauchy preferential crossover-based global pollination algorithm for MPPT in photovoltaic system	Sundararaj, Vinu; Anna Univ, Dept Elect & Communcat, Chennai, Tamil Nadu, India	PROGRESS IN PHOTOVOLTAICS;7.953	112
76	A review and comparative evaluation of thermochemical water splitting cycles for hydrogen production	Safari, Farid; Univ Ontario Inst Technol, Clean Energy Res Lab, 2000 Simcoe St North, Oshawa, ON L1G 0C5, Canada	ENERGY CONVERSION AND MANAGEMENT;9.709	109
77	A comprehensive review of battery modeling and state estimation approaches for advanced battery management systems	Wang, Yujie; Univ Sci & Technol China, Dept Automat, Hefei 230027, Anhui, Peoples R China	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	108
78	High-purity pyrrole-type FeN4 sites as a superior oxygen reduction electrocatalyst	Zhang, Nan; Univ Sci & Technol China, Natl Synchrotron Radiat Lab, Hefei 230029, Anhui, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	108
79	Electrochemical reduction of nitrate to ammonia via direct eight-electron transfer using a copper-molecular solid catalyst	Chen, Gao-Feng; South China Univ Technol, Sch Chem & Chem Engn, Guangzhou, Peoples R China	NATURE ENERGY;60.858	108
80	Electrolyte design for LiF-rich solid-electrolyte interfaces to enable high-performance microsized	Chen, Ji; Univ Maryland, Dept Chem & Biomol Engn, College Pk, MD 20742	NATURE ENERGY;60.858	106

	alloy anodes for batteries	USA		
81	Challenges and Key Parameters of Lithium-Sulfur Batteries on Pouch Cell Level	Doerfler, Susanne; Fraunhofer Inst Mat & Beam Technol IWS, Winterbergstr 28, D-01277 Dresden, Germany	JOULE;41.248	105
82	A Layer-by-Layer Architecture for Printable Organic Solar Cells Overcoming the Scaling Lag of Module Efficiency	Sun, Rui; Wuhan Univ, Inst Adv Studies, Wuhan 430072, Peoples R China	JOULE;41.248	105
83	Molecular engineering of dispersed nickel phthalocyanines on carbon nanotubes for selective CO2 reduction	Zhang, Xiao; Southern Univ Sci & Technol, Dept Mat Sci & Engn, Shenzhen, Peoples R China	NATURE ENERGY;60.858	104
84	Water-energy-ecosystem nexus: Balancing competing interests at a run-of-river hydropower plant coupling a hydrologic-ecohydraulic approach	Kuriqi, Alban; Univ Lisbon, Inst Super Tecn, CERIS, Lisbon, Portugal	ENERGY CONVERSION AND MANAGEMENT;9.709	103
85	Lignocellulose biomass pyrolysis for bio-oil production: A review of biomass pre-treatment methods for production of drop-in fuels	Kumar, R.; Macquarie Univ, Fac Sci & Engn, Dept Earth & Environm Sci, Sydney, NSW 2109, Australia	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	103
86	Temporary reduction in fine particulate matter due to 'anthropogenic emissions switch-off' during COVID-19 lockdown in Indian cities	Kumar, Prashant; Univ Surrey, Fac Engn & Phys Sci, Global Ctr Clean Air Res GCARE, Dept Civil & Environm Engn, Guildford GU2 7XH, Surrey, England	SUSTAINABLE CITIES AND SOCIETY;7.587	101
87	Highly selective electrocatalytic CO(2)reduction to ethanol by metallic clusters dynamically formed from atomically dispersed copper	Xu, Haiping; Argonne Natl Lab, Chem Sci & Engn Div, Lemont, IL 60439 USA	NATURE ENERGY;60.858	98
88	Highly quaternized polystyrene ionomers for high performance anion exchange membrane water electrolysers	Li, Dongguo; Los Alamos Natl Lab, MPA 11 Mat Synth & Integrated Devices, Los Alamos, NM 87545 USA	NATURE ENERGY;60.858	97
89	A critical review of the effects of pretreatment	Soltanian, Salman; Biofuel Res Team	ENERGY CONVERSION	96

	methods on the exergetic aspects of lignocellulosic biofuels	BRTeam, Karaj, Iran	AND MANAGEMENT;9.709	
90	Deep solar radiation forecasting with convolutional neural network and long short-term memory network algorithms	Ghimire, Sujan; Univ Southern Queensland, Ctr Sustainable Agr Syst, Sch Agr Computat & Environm Sci, Springfield, Qld 4300, Australia	APPLIED ENERGY;9.746	96
91	Recent advances in carbon dioxide utilization	Zhang, Zhien; Ohio State Univ, William G Lowrie Dept Chem & Biomol Engn, Columbus, OH 43210 USA	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	96
92	Evolution of the Lignin Chemical Structure during the Bioethanol Production Process and Its Inhibition to Enzymatic Hydrolysis	Zhao, Chao; Zhejiang A&F Univ, Sch Engn, Natl Engn Res Ctr Wood Based Resource Utilizat, Linan 311300, Zhejiang, Peoples R China	ENERGY & FUELS;3.605	94
93	Application of graphene in energy storage device - A review	Olabi, A. G.; Univ Sharjah, Dept Sustainable & Renewable Energy Engn, POB 27272, Sharjah, U Arab Emirates	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	93
94	Highly Selective CO2 Capture and Its Direct Photochemical Conversion on Ordered 2D/1D Heterojunctions	Xia, Yang; Wuhan Univ Technol, State Key Lab Adv Technol Mat Synth & Proc, Wuhan 430070, Hubei, Peoples R China	JOULE;41.248	93
95	A History and Perspective of Non-Fullerene Electron Acceptors for Organic Solar Cells	Armin, Ardalan; Swansea Univ, Dept Phys, Sustainable Adv Mat Ser SAM, Singleton Pk, Swansea SA2 8PP, W Glam, Wales	ADVANCED ENERGY MATERIALS;29.368	92
96	A state-of-the-art review on thermochemical conversion of biomass for biofuel production: A TG-FTIR approach	Ong, Hwai Chyuan; Univ Malaya, Fac Engn, Dept Mech Engn, Kuala Lumpur 50603, Malaysia	ENERGY CONVERSION AND MANAGEMENT;9.709	90
97	A holistic approach to interface stabilization for	Liu, Zonghao; Okinawa Inst Sci &	NATURE ENERGY;60.858	90

	efficient perovskite solar modules with over 2,000-hour operational stability	Technol Grad Univ OIST, Energy Mat & Surface Sci Unit EMSSU, Onna, Okinawa, Japan		
98	Comprehensive overview of meta-heuristic algorithm applications on PV cell parameter identification	Yang, Bo; Kunming Univ Sci & Technol, Fac Elect Power Engn, Kunming 650500, Yunnan, Peoples R China	ENERGY CONVERSION AND MANAGEMENT;9.709	88
99	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	APPLIED ENERGY;9.746	88
100	Two-dimensional Ruddlesden-Popper layered perovskite solar cells based on phase-pure thin films	Liang, Chao; Nanjing Tech Univ, Key Lab Flexible Elect KLOFE, Nanjing, Peoples R China	NATURE ENERGY;60.858	86
101	Progress in biomass torrefaction: Principles, applications and challenges	Chen, Wei-Hsin; Natl Cheng Kung Univ, Dept Aeronaut & Astronaut, Tainan 701, Taiwan	PROGRESS IN ENERGY AND COMBUSTION SCIENCE;29.394	86
102	Conjugated Organic Cations Enable Efficient Self-Healing FASnI(3) Solar Cells	Ran, Chenxin; Xi An Jiao Tong Univ, Sch Elect & Informat Engn, Minist Educ, Key Lab Phys Elect & Devices, 28 Xianning West Rd, Xian 710049, Shaanxi, Peoples R China	JOULE;41.248	86
103	Surface Engineering of Ambient-Air-Processed Cesium Lead Triiodide Layers for Efficient Solar Cells	Yoon, So Me; Ulsan Natl Inst Sci & Technol, Sch Energy & Chem Engn, Dept Energy Engn, 50 UNIST Gil, Ulsan 44919, South Korea	JOULE;41.248	86
104	Boron-doped nitrogen-deficient carbon nitride-based Z-scheme heterostructures for photocatalytic overall water splitting	Zhao, Daming; Xi An Jiao Tong Univ, State Key Lab Multiphase Flow Power Engn, Int Res Ctr Renewable Energy,	NATURE ENERGY;60.858	85

		Xian, Peoples R China		
105	Solar cell efficiency tables (version 57)	Green, Martin; Univ New South Wales, Sch Photovolta & Renewable Energy Engn, Australian Ctr Adv Photovolta, Sydney, NSW, Australia	PROGRESS IN PHOTOVOLTAICS;7.953	85
106	The energy and environmental footprints of COVID-19 fighting measures - PPE, disinfection, supply chains	Klemes, Jiri Jaromir; Brno Univ Technol, VUT Brno, Fac Mech Engn, NETME Ctr, Sustainable Proc Integrat Lab SPIL, Tech 2896-2, Brno 61669, Czech Republic	ENERGY;7.147	84
107	Efficient Perovskite Solar Cell Modules with High Stability Enabled by Iodide Diffusion Barriers	Bi, Enbing; Shanghai Jiao Tong Univ, Sch Mat Sci & Engn, State Key Lab Met Matrix Composites, 800 Dong Chuan RD, Shanghai 200240, Peoples R China	JOULE;41.248	84
108	Effect of urbanization and international trade on CO2 emissions across 65 belt and road initiative countries	Muhammad, Sulaman; Jiangsu Univ, Sch Management, Zhenjiang 212013, Jiangsu, Peoples R China	ENERGY;7.147	83
109	Fuel cell application in the automotive industry and future perspective	Olabi, A. G.; Univ Sharjah, Dept Sustainable & Renewable Energy Engn, POB 27272, Sharjah, U Arab Emirates	ENERGY;7.147	82
110	Current status, research trends, and challenges in water electrolysis science and technology	Grigoriev, S. A.; Natl Res Ctr, Kurchatov Inst, 1 Kurchatov Sq, Moscow 123182, Russia	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	81
111	Strategies for the Stabilization of Zn Metal Anodes for Zn-Ion Batteries	Yi, Zhehan; Tianjin Univ, Sch Mat Sci & Engn, Minist Educ, Key Lab Adv Ceram & Machining Technol, Tianjin 300072, Peoples R China	ADVANCED ENERGY MATERIALS;29.368	81
112	Green hydrogen from anion exchange membrane	Miller, Hamish Andrew; CNR, ICCOM, Ist	SUSTAINABLE ENERGY &	79

	water electrolysis: a review of recent developments in critical materials and operating conditions	Chim Composti Organometallici, Via Madonna Piano 10, I-50019 Florence, Italy	FUELS;6.367	
113	Modulation of Defects and Interfaces through Alkylammonium Interlayer for Efficient Inverted Perovskite Solar Cells	Wu, Shengfan; City Univ Hong Kong, Dept Chem, Kowloon, Hong Kong, Peoples R China	JOULE;41.248	79
114	Low-temperature and high-rate-charging lithium metal batteries enabled by an electrochemically active monolayer-regulated interface	Gao, Yue; Penn State Univ, Dept Mech Engn, University Pk, PA 16802 USA	NATURE ENERGY;60.858	79
115	Ecological impacts of run -of -river hydropower plants ? Current status and future prospects on the brink of energy transition	Kuriqi, Alban; Univ Lisbon, Inst Super Tecn, CERIS, Av Rovisco Pais 1, P-1049001 Lisbon, Portugal	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	78
116	Investigation of solar collector system with turbulator considering hybrid nanoparticles	Sheikholeslami, M.; Babol Noshirvani Univ Technol, Dept Mech Engn, Babol, Iran	RENEWABLE ENERGY;8.001	78
117	Guidelines for performing lignin-first biorefining	Abu-Omar, Mahdi M.; Univ Calif Santa Barbara, Dept Chem Engn, Santa Barbara, CA 93106 USA	ENERGY & ENVIRONMENTAL SCIENCE;38.532	78
118	Sulfur-assisted large-scale synthesis of graphene microspheres for superior potassium-ion batteries	Zhang, Qingfeng; Hunan Univ, Sch Phys & Elect, Hunan Prov Key Lab Multielectron Based Energy Sto, Changsha, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	76
119	Intact 2D/3D halide junction perovskite solar cells via solid-phase in-plane growth	Jang, Yeoun-Woo; Seoul Natl Univ, Global Frontier Ctr Multiscale Energy Syst, Seoul, South Korea	NATURE ENERGY;60.858	76
120	Ultrahigh power and energy density in partially ordered lithium-ion cathode materials	Ji, Huiwen; Univ Calif Berkeley, Dept Mat Sci & Engn, Berkeley, CA 94720 USA	NATURE ENERGY;60.858	75

121	First-cycle voltage hysteresis in Li-rich 3dcathodes associated with molecular O(2)trapped in the bulk	House, Robert A.; Univ Oxford, Dept Mat, Oxford, England	NATURE ENERGY;60.858	75
122	Microbial degradation of dyes: An overview	Varjani, Sunita; Gujarat Pollut Control Board, Gandhinagar 382010, Gujarat, India	BIORESOURCE TECHNOLOGY;9.642	72
123	A review of melting and freezing processes of PCM/nano-PCM and their application in energy storage	Rostami, Sara; Ton Duc Thang Univ, Adv Inst Mat Sci, Lab Magnetism & Magnet Mat, Ho Chi Minh City, Vietnam	ENERGY;7.147	72
124	Data-driven state of charge estimation for lithium-ion battery packs based on Gaussian process regression	Deng, Zhongwei; Chongqing Univ, Dept Automot Engn, State Key Lab Mech Transmiss, Chongqing 400044, Peoples R China	ENERGY;7.147	71
125	The effect of FDI on environmental emissions: Evidence from a meta-analysis	Demena, Binyam Afewerk; Erasmus Univ, Int Inst Social Studies, Kortenaerkade 12, NL-2518 AX The Hague, Netherlands	ENERGY POLICY;6.142	70
126	The role of exciton lifetime for charge generation in organic solar cells at negligible energy-level offsets	Classen, Andrej; Friedrich Alexander Univ Erlangen Nurnberg, Inst Mat Elect & Energy Technol MEET, Erlangen, Germany	NATURE ENERGY;60.858	68
127	A novel battery thermal management system using nano-enhanced phase change materials	Jilte, Ravindra; Lovely Profess Univ, Dept Mech Engn, Phagwara 144411, Punjab, India	ENERGY;7.147	68
128	Critical review of energy storage systems	Olabi, A. G.; Univ Sharjah, Dept Sustainable & Renewable Energy Engn, POB 27272, Sharjah, U Arab Emirates	ENERGY;7.147	67
129	Transparent photovoltaic technologies: Current trends	Pulli, Emilio; Politecn Torino, Dept	ENERGY CONVERSION	67

	towards upscaling	Energy, Corso Duca Abruzzi 24, I-10129 Turin, Italy	AND MANAGEMENT;9.709	
130	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	ENERGY POLICY;6.142	67
131	An overview of solar photovoltaic panels' end-of-life material recycling	Chowdhury, Md Shahariar; Prince Songkla Univ, Fac Environm Management, Dept Sustainable Energy, Hat Yai 90110, Thailand	ENERGY STRATEGY REVIEWS;6.425	66
132	Effect of self-doped heteroatoms on the performance of biomass-derived carbon for supercapacitor applications	Gopalakrishnan, Arthi; Indian Inst Technol Hyderabad, Dept Elect Engn, Hyderabad 502285, India	JOURNAL OF POWER SOURCES;9.127	66
133	Public spending and green economic growth in BRI region: Mediating role of green finance	Zhang, Dongyang; Capital Univ Econ & Business, Sch Econ, Beijing 100070, Peoples R China	ENERGY POLICY;6.142	66
134	Free convection and radiation effects in nanofluid (Silicon dioxide and Molybdenum disulfide) with second order velocity slip, entropy generation, Darcy-Forchheimer porous medium	Khan, M. Ijaz; Riphah Int Univ I 14, Dept Math & Stat, Islamabad 44000, Pakistan	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	65
135	16% efficiency all-polymer organic solar cells enabled by a finely tuned morphology via the design of ternary blend	Liu, Tao; Shandong Normal Univ, Collaborat Innovat Ctr Functionalized Probes Chem, Coll Chem Chem Engn & Mat Sci,Minist Educ,Shandon, Inst Mat & Clean Energy,Key Lab Mol & Nano Probes, Jinan 250014, Peoples R China	JOULE;41.248	65
136	The heterogeneity of renewable energy consumption, carbon emission and financial development in the	Khan, Hayat; Guangxi Univ, Business Sch, Nanning, Peoples R China	ENERGY REPORTS;6.870	63

	globe: A panel quantile regression approach			
137	How does environmental regulation promote technological innovations in the industrial sector? Evidence from Chinese provincial panel data	Ouyang, Xiaoling; East China Normal Univ, Fac Econ & Management, Sch Econ, Shanghai 200062, Peoples R China	ENERGY POLICY;6.142	63
138	A state-of-the-art review on dual purpose seaweeds utilization for wastewater treatment and crude bio-oil production	Wang, Shuang; Jiangsu Univ, Sch Energy & Power Engn, Zhenjiang 212013, Jiangsu, Peoples R China	ENERGY CONVERSION AND MANAGEMENT;9.709	62
139	Recent advances in energy storage mechanism of aqueous zinc-ion batteries	Chen, Duo; Jilin Univ, Coll Phys, Sino Russian Int Joint Lab Clean Energy & Energy, Changchun 130012, Jilin, Peoples R China	JOURNAL OF ENERGY CHEMISTRY;9.676	59
140	CO2 capture adsorbents functionalized by amine ? bearing polymers: A review	Varghese, Anish Mathai; Khalifa Univ, Dept Chem Engn, POB 127788, Abu Dhabi, U Arab Emirates	INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL;3.738	59
141	The role of adsorbed hydroxide in hydrogen evolution reaction kinetics on modified platinum	McCrum, Ian T.; Leiden Univ, Leiden Inst Chem, Leiden, Netherlands	NATURE ENERGY;60.858	58
142	Atomically Dispersed Cobalt Trifunctional Electrocatalysts with Tailored Coordination Environment for Flexible Rechargeable Zn-Air Battery and Self-Driven Water Splitting	Zhang, Zheye; Nanyang Technol Univ, Sch Chem & Biomed Engn, 70 Nanyang Dr, Singapore 637457, Singapore	ADVANCED ENERGY MATERIALS;29.368	58
143	Electrolyte Strategies toward Better Zinc-Ion Batteries	Liu, Cunxin; Cent South Univ, Sch Mat Sci & Engn, Key Lab Elect Packaging & Adv Funct Mat Hunan Pro, Changsha 410083, Hunan, Peoples R China	ACS ENERGY LETTERS;23.101	57
144	A review of phase change heat transfer in shape-stabilized phase change materials (ss-PCMs) based	Zhang, Shuai; Univ Nottingham, Fac Engn, Fluids & Thermal Engn FLUTE	RENEWABLE & SUSTAINABLE ENERGY	56

	on porous supports for thermal energy storage	Res Grp, Nottingham NG7 2RD, England	REVIEWS;14.982	
145	Modelling the dynamic linkages between eco-innovation, urbanization, economic growth and ecological footprints for G7 countries: Does financial globalization matter?	Ahmad, Mahmood; Univ Int Business & Econ, Sch Int Trade & Econ, Beijing, Peoples R China	SUSTAINABLE CITIES AND SOCIETY;7.587	55
146	Opportunities for improving biodiesel production via lipase catalysis	Tavares Cavalcante, Francisco Thalysson; Univ Fed Ceara, Dept Engn Quim, Campus Pici,Bloco 709, BR-60455760 Fortaleza, CE, Brazil	FUEL;6.609	54
147	A review on hydrogen generation from the hydrolysis of sodium borohydride	Abdelhamid, Hani Nasser; Assiut Univ, Dept Chem, Adv Multifunct Mat Lab, Assiut 71516, Egypt	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	54
148	Post-lithium-ion battery cell production and its compatibility with lithium-ion cell production infrastructure	Duffner, Fabian; Univ Munster, Inst Business Adm, Dept Chem & Pharm, Munster, Germany	NATURE ENERGY;60.858	54
149	Carbon quantum dots for advanced electrocatalysis	Tian, Lin; Xuzhou Univ Technol, Sch Mat & Chem Engn, Xuzhou 221018, Jiangsu, Peoples R China	JOURNAL OF ENERGY CHEMISTRY;9.676	54
150	Effect of Sr@ZnO nanoparticles and Ricinus communis biodiesel-diesel fuel blends on modified CRDI diesel engine characteristics	Soudagar, Manzoore Elahi M.; Univ Malaya, Fac Engn, Dept Mech Engn, Kuala Lumpur 50603, Malaysia	ENERGY;7.147	54
151	Vacuum pyrolysis incorporating microwave heating and base mixture modification: An integrated approach to transform biowaste into eco-friendly bioenergy products	Ge, Shengbo; Henan Agr Univ, Henan Prov Engn Res Ctr Biomass Value Added Prod, Zhengzhou 450002, Peoples R China	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	53
152	Over 17% Efficiency Binary Organic Solar Cells with Photoresponses Reaching 1000 nm Enabled by	Qi, Feng; City Univ Hong Kong, Dept Chem, Kowloon, Hong Kong 999077,	ACS ENERGY LETTERS;23.101	53

	Selenophene-Fused Nonfullerene Acceptors	Peoples R China		
153	Organic Solar Cells-The Path to Commercial Success	Riede, Moritz; Univ Oxford, Dept Phys, Parks Rd, Oxford OX1 3PJ, England	ADVANCED ENERGY MATERIALS;29.368	52
154	Liquid Thermo-Responsive Smart Window Derived from Hydrogel	Zhou, Yang; Nanyang Technol Univ, Sch Mat Sci & Engn, Singapore 639798, Singapore	JOULE;41.248	50
155	Toward Reducing the Operation Temperature of Solid Oxide Fuel Cells: Our Past 15 Years of Efforts in Cathode Development	Yang, Guangming; Nanjing Tech Univ, Coll Chem Engn, State Key Lab Mat Oriented Chem Engn, Nanjing 211816, Jiangsu, Peoples R China	ENERGY & FUELS;3.605	49
156	Multi-objective optimization and multi-criteria decision-making methods for optimal design of standalone photovoltaic system: A comprehensive review	Ridha, Hussein Mohammed; Univ Putra Malaysia, Dept Elect & Elect Engn, Fac Engn, Serdang 43400, Malaysia	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	48
157	Metal hydride hydrogen storage and compression systems for energy storage technologies	Tarasov, Boris P.; Russian Acad Sci, Inst Problems Chem Phys IPCP, Chernogolovka 142432, Russia	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	46
158	Achieving over 17% efficiency of ternary all-polymer solar cells with two well-compatible polymer acceptors	Sun, Rui; Wuhan Univ, Inst Adv Studies, Wuhan 430072, Peoples R China	JOULE;41.248	46
159	Impact of the COVID-19 pandemic on travel behavior in Istanbul: A panel data analysis	Shakibaei, Shahin; Istanbul Tech Univ, Civil Engn Fac, Transportat Engn Dept, Istanbul, Turkey	SUSTAINABLE CITIES AND SOCIETY;7.587	46
160	High-power Mg batteries enabled by heterogeneous enolization redox chemistry and weakly coordinating electrolytes	Dong, Hui; Univ Houston, Dept Elect & Comp Engn, Houston, TX 77004 USA	NATURE ENERGY;60.858	45
161	Microalgae an ecofriendly and sustainable	Hussain, Fida; Qurtuba Univ Sci &	RENEWABLE &	44

	wastewater treatment option: Biomass application in biofuel and bio-fertilizer production. A review	Informat Technol, Dept Bot, Peshawar 25100, Pakistan	SUSTAINABLE ENERGY REVIEWS;14.982	
162	A comprehensive review on anaerobic digestion of organic fraction of municipal solid waste	Zamri, M. F. M. A.; Univ Tenaga Nas, Inst Sustainable Energy, Jalan IKRAM UNITEN, Kajang 43000, Selangor, Malaysia	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	44
163	Reduced non-radiative charge recombination enables organic photovoltaic cell approaching 19% efficiency	Bi, Pengqing; Chinese Acad Sci, State Key Lab Polymer Phys & Chem, Sci CAS Res Educ Ctr Excellence Mol Sci, Inst Chem,Beijing Natl Lab Mol, Beijing 100190, Peoples R China	JOULE;41.248	44
164	A Review on Advanced FeNi-Based Catalysts for Water Splitting Reaction	Li, Dongze; Yangzhou Univ, Sch Chem & Chem Engn, Yangzhou 225002, Jiangsu, Peoples R China	ENERGY & FUELS;3.605	43
165	A review of lithium-ion battery safety concerns: The issues, strategies, and testing standards	Chen, Yuqing; Hunan Univ, Coll Mat Sci & Engn, Hunan Prov Key Lab Adv Carbon Mat & Appl Technol, Changsha 410082, Peoples R China	JOURNAL OF ENERGY CHEMISTRY;9.676	43
166	Recent advances on nanofluids for low to medium temperature solar collectors: energy, exergy, economic analysis and environmental impact	Said, Zafar; Univ Sharjah, Coll Engn, Sustainable & Renewable Energy Engn Dept, POB 27272, Sharjah, U Arab Emirates	PROGRESS IN ENERGY AND COMBUSTION SCIENCE;29.394	42
167	Highly active sites of NiVB nanoparticles dispersed onto graphene nanosheets towards efficient and pH-universal overall water splitting	Arif, Muhammad; Beijing Normal Univ, Coll Chem, Beijing Key Lab Energy Convers & Storage Mat, Beijing 100875, Peoples R China	JOURNAL OF ENERGY CHEMISTRY;9.676	42
168	Low-Bandgap Non-fullerene Acceptors Enabling	Liu, Wei; Cent South Univ, Coll Chem &	ACS ENERGY	42

	High-Performance Organic Solar Cells	Chem Engn, Changsha 410083, Peoples R China	LETTERS;23.101	
169	Review on Ammonia as a Potential Fuel: From Synthesis to Economics	Amer-Hatem, F.; Minist Educ, Gen Directorate Educ Diyala, Diyala 32001, Iraq	ENERGY & FUELS;3.605	41
170	Boosting cell performance of LiNi0.8Co0.1Mn0.1O2 cathode material via structure design	Tang, Lin-bo; Cent South Univ, Sch Met & Environm, Changsha 410083, Hunan, Peoples R China	JOURNAL OF ENERGY CHEMISTRY;9.676	40
171	Understanding land surface temperature impact factors based on local climate zones	Yang, Jun; Liaoning Normal Univ, Human Settlements Res Ctr, Dalian 116029, Peoples R China	SUSTAINABLE CITIES AND SOCIETY;7.587	40
172	A review on biochar production techniques and biochar based catalyst for biofuel production from algae	Nguyen Thuy Lan Chi; Ton Duc Thang Univ, Fac Environm & Labour Safety, Innovat Green Prod Synth & Renewable Environm Dev, Ho Chi Minh City, Vietnam	FUEL;6.609	39
173	Cost-effective iron-based aqueous redox flow batteries for large-scale energy storage application: A review	Zhang, Huan; Dalian Polytech Univ, Sch Text & Mat Engn, Dalian 116034, Peoples R China	JOURNAL OF POWER SOURCES;9.127	39
174	Carbon allotrope hybrids advance thermoelectric development and applications	Liu, Wei-Di; Nanjing Tech Univ, Coll Chem Engn, State Key Lab Mat Oriented Chem Engn, Nanjing 210009, Peoples R China	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	38
175	A review and recent advances in solar-to-hydrogen energy conversion based on photocatalytic water splitting over doped-TiO2 nanoparticles	Ismael, Mohammed; Carl von Ossietzky Univ Oldenburg, Inst Chem, Tech Chem, Carl von Ossietzky Str 9-11, D-26129 Oldenburg, Germany	SOLAR ENERGY;5.742	35
176	Low-cost renewable electricity as the key driver of the	Bogdanov, Dmitrii; LUT Univ,	ENERGY;7.147	35

	global energy transition towards sustainability	Yliopistonkatu 34, Lappeenranta 53850, Finland		
177	Hydrogen in energy transition: A review	Kovac, Ankica; Univ Zagreb, Fac Mech Engn & Naval Architecture, Ivan Lucica 5, Zagreb 10000, Croatia	INTERNATIONAL JOURNAL OF HYDROGEN ENERGY;5.816	35
178	Reservoir space and enrichment model of shale oil in the first member of Cretaceous Qingshankou Formation in the Changling Sag, southern Songliao Basin, NE China	Liu Bo; Northeast Petr Univ, Key Lab Continental Shale Hydrocarbon Accumulat &, Minist Educ, Daqing 163318, Peoples R China	PETROLEUM EXPLORATION AND DEVELOPMENT;3.803	35
179	Flame-retardant and solid-solid phase change composites based on dopamine-decorated BP nanosheets/Polyurethane for efficient solar-to-thermal energy storage	Du, Xiaosheng; Sichuan Univ, Coll Biomass Sci & Engn, 24 South Sect 1,Yihuan Rd, Chengdu 610065, Peoples R China	RENEWABLE ENERGY;8.001	35
180	Recent advances in the sustainable design and applications of biodegradable polymers	Rai, Pawankumar; CSIR, Food Drug & Chem Toxicol Grp, Indian Inst Toxicol Res, Lucknow 226001, Uttar Pradesh, India	BIORESOURCE TECHNOLOGY;9.642	35
181	Advanced research trends in dye-sensitized solar cells	Kokkonen, Mikko; Univ Oulu, Microelect Res Unit, Fac Informat Technol & Elect Engn, POB 4500, FI-90014 Oulu, Finland	JOURNAL OF MATERIALS CHEMISTRY A;12.732	35
182	Defect compensation in formamidinium-caesium perovskites for highly efficient solar mini-modules with improved photostability	Deng, Yehao; Univ North Carolina Chapel Hill, Dept Appl Phys Sci, Chapel Hill, NC 27515 USA	NATURE ENERGY;60.858	34
183	Two-phase deep learning model for short-term wind direction forecasting	Tang, Zhenhao; Northeast Elect Power Univ, Coll Automat Engn, Jilin, Jilin, Peoples R China	RENEWABLE ENERGY;8.001	34
184	Biowaste-to-bioplastic (polyhydroxyalkanoates):	Bhatia, Shashi Kant; Konkuk Univ, Coll	BIORESOURCE	34

	Conversion technologies, strategies, challenges, and perspective	Engn, Dept Biol Engn, Seoul 05029, South Korea	TECHNOLOGY;9.642	
185	Recent Advances in Cs2AgBiBr6-Based Halide Double Perovskites as Lead-Free and Inorganic Light Absorbers for Perovskite Solar Cells	Yang, Xiaoqing; Nanjing Tech Univ, Coll Chem Engn, State Key Lab Mat Oriented Chem Engn, Nanjing 210009, Peoples R China	ENERGY & FUELS;3.605	33
186	Linking renewable energy, globalization, agriculture, CO2 emissions and ecological footprint in BRIC countries: A sustainability perspective	Pata, Ugur Korkut; Osmaniye Korkut Ata Univ, Fac Econ & Adm Sci, Dept Econ, TR-80000 Merkez Osmaniye, Turkey	RENEWABLE ENERGY;8.001	33
187	Fine-tuning of side-chain orientations on nonfullerene acceptors enables organic solar cells with 17.7% efficiency	Chai, Gaoda; Hong Kong Univ Sci & Technol, Shenzhen Res Inst, 9 Yuexing First RD,Hitech Pk, Shenzhen 518057, Peoples R China	ENERGY & ENVIRONMENTAL SCIENCE;38.532	33
188	Sustainable processing of food waste for production of bio-based products for circular bioeconomy	Sharma, Poonam; Integral Univ, Dept Bioengn, Lucknow, Uttar Pradesh, India	BIORESOURCE TECHNOLOGY;9.642	32
189	One dimensional fast computational partial differential model for heat transfer in lithium-ion batteries	Mevawalla, A.; Univ Waterloo, Dept Chem Engn, 200 Univ Ave West, Waterloo, ON N2L 3G1, Canada	JOURNAL OF ENERGY STORAGE;6.583	31
190	Hydrogen energy systems: A critical review of technologies, applications, trends and challenges	Yue, Meiling; Univ Bourgogne Franche Comte, CNRS, FEMTO ST Inst, Rue Ernest Thierry Mieg, F-90000 Belfort, France	RENEWABLE & SUSTAINABLE ENERGY REVIEWS;14.982	31
191	Shear mechanical responses of sandstone exposed to high temperature under constant normal stiffness boundary conditions	Yin, Qian; China Univ Min & Technol, State Key Lab Geomech & Deep Underground Engn, Xuzhou 221116, Jiangsu, Peoples R China	GEOMECHANICS AND GEOPHYSICS FOR GEO-ENERGY AND GEO-RESOURCES;3.750	31
192	Recent advances and perspectives on vanadium-	Liu, Na; North China Univ Sci & Technol,	JOURNAL OF ENERGY	31

	and manganese-based cathode materials for aqueous zinc ion batteries	Sch Chem Engn, Tangshan 063009, Hebei, Peoples R China	CHEMISTRY;9.676	
193	Computational single-phase comparative study of a Williamson nanofluid in a parabolic trough solar collector via the Keller box method	Jamshed, Wasim; Capital Univ Sci & Technol CUST, Dept Math, Islamabad, Pakistan	INTERNATIONAL JOURNAL OF ENERGY RESEARCH;5.164	30
194	A novel Bi2S3/KTa0.75Nb0.25O3 nanocomposite with high efficiency for photocatalytic and piezocatalytic N-2 fixation	Chen, Lu; Zhejiang Normal Univ, Dept Mat Sci & Engn, Jinhua 321004, Zhejiang, Peoples R China	JOURNAL OF MATERIALS CHEMISTRY A;12.732	30
195	22.8%-Efficient single-crystal mixed-cation inverted perovskite solar cells with a near-optimal bandgap	Alsalloum, Abdullah Y.; King Abdullah Univ Sci & Technol, Div Phys Sci & Engn, Thuwal 239556900, Saudi Arabia	ENERGY & ENVIRONMENTAL SCIENCE;38.532	30
196	The nexuses between energy investments, technological innovations, emission taxes, and carbon emissions in China	Ma, Qiang; Liaoning Petrochem Univ, Sch Econ & Management, Jinzhou 113001, Peoples R China	ENERGY POLICY;6.142	30
197	Recent progress in covalent organic frameworks as light-emitting materials	Xu, S.; City Univ Hong Kong, Dept Mat Sci & Engn, 83 Tat Chee Ave, Hong Kong 999077, Peoples R China	MATERIALS TODAY ENERGY;7.311	30
198	Experimental investigations of the performance of a flat-plate solar collector using carbon and metal oxides based nanofluids	Akram, Naveed; Univ Malaya, Fac Engn, Dept Mech Engn, Kuala Lumpur 50603, Malaysia	ENERGY;7.147	28
199	Embedding Fe2P nanocrystals in bayberry-like N, P-enriched carbon nanospheres as excellent oxygen reduction electrocatalyst for zinc-air battery	Wang, Ruixiang; Jiangxi Univ Sci & Technol, Fac Mat Met & Chem, Ganzhou 341000, Peoples R China	JOURNAL OF POWER SOURCES;9.127	28
200	Effects of injection timing and EGR on combustion and emissions characteristics of the diesel engine fuelled with acetone-butanol-ethanol/diesel blend fuels	Duan, Xiongbo; Hunan Univ, State Key Lab Adv Design & Mfg Vehicle Body, Changsha 410082, Peoples R China	ENERGY;7.147	26

201	Investigation and simulation of electric train utilizing hydrogen fuel cell and lithium-ion battery	Akhoundzadeh, M. Haji; Univ Waterloo, Dept Chem Engn, Univ Ave West, Waterloo, ON N2L 3G1, Canada	SUSTAINABLE ENERGY TECHNOLOGIES AND ASSESSMENTS;5.353	26
202	Improving the efficiency of microseismic source locating using a heuristic algorithm-based virtual field optimization method	Zhou, Jian; Cent South Univ, Sch Resources & Safety Engn, Changsha 410083, Peoples R China	GEOMECHANICS AND GEOPHYSICS FOR GEO-ENERGY AND GEO-RESOURCES;3.750	25
203	Interfacial assembly of two-dimensional MXenes	Zhang, Chuanfang (John); ETH Domain, Lab Funct Polymers, Swiss Fed Labs Mat Sci & Technol Empa, Uberlandstr 129, CH-8600 Dubendorf, Switzerland	JOURNAL OF ENERGY CHEMISTRY;9.676	25
204	Influence of air oxidative and non-oxidative torrefaction on the chemical properties of corn stalk	Wang, Qing; Northeast Elect Power Univ, Engn Res Ctr Oil Shale Comprehens Utilizat, Minist Educ, Jilin 132012, Jilin, Peoples R China	BIORESOURCE TECHNOLOGY;9.642	25
205	Does internet development improve green total factor energy efficiency? Evidence from China	Wu, Haitao; Beijing Inst Technol, Sch Management & Econ, 5 Zhongguancun South St, Beijing 100081, Peoples R China	ENERGY POLICY;6.142	24
206	Association of built environment attributes with the spread of COVID-19 at its initial stage in China	Li, Shuangjin; Hiroshima Univ, Grad Sch Int Dev & Cooperat, Mobil & Urban Policy Lab, Higashihiroshima 7398529, Japan	SUSTAINABLE CITIES AND SOCIETY;7.587	24
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210	An integrated control algorithm of power distribution for islanded microgrid based on improved virtual synchronous generator	Zhang, Liang; Northeast Elect Power Univ, Minist Educ, Key Lab Modern Power Syst Simulat & Control & Ren, Jilin 132012, Jilin, Peoples R China	IET RENEWABLE POWER GENERATION;3.930	17
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