Curated Research Articles

Generated: 2026-02-16 04:29

- **Enhancing Ion-Electron Transport in Positive Electrode of Solid-State Lithium Metal Batteries With Multifunctional Catholyte Made of Polymer Mixed Ionic-Electronic Conductor PEDOT:PSSTFSI and Li3InCl6** — score: 1.000 The study presents the use of the mixed ionic-electronic conductor PEDOT:PSSTFSI as a binder in positive electrode composites (PECs) for all-solid-state lithium metal batteries, significantly enhancing their ionic and electronic conductivity. Optimal loading of the polymer improves the electrode's discharge capacity and rate capability, while reducing porosity and maintaining long-term performance, thus demonstrating its potential in advancing battery technologies. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **Prussian Blue Analogue Cathodes for Post-Lithium-Ion Batteries: Recent Advances and Future Perspectives** — score: 1.000 This review focuses on the recent advancements in engineering Prussian blue analogues (PBAs) to overcome challenges like phase instability and Jahn-Teller distortions, which hinder their application in post-lithium-ion batteries. It assesses various strategies, including elemental doping and high-entropy design, to optimize their electrochemical properties and ion transport dynamics, ultimately providing a strategic blueprint for the development of high-performance and sustainable PBA cathodes in future energy storage systems. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **[ASAP] Chemical Imaging of Cathode–Electrolyte Interphase in Sulfide Solid-State Batteries** — score: 1.000 The article discusses advancements in the chemical imaging of the cathode–electrolyte interphase in sulfide solid-state batteries, focusing on techniques that enhance the understanding of interfacial phenomena. These insights aim to improve the performance and longevity of solid-state battery systems. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **Lithium transport from operando microscopy: Kinetic trapping in lithium manganese oxide** — score: 1.000 The article explores lithium transport in lithium manganese oxide using operando microscopy techniques. It reveals that kinetic trapping can significantly influence lithium diffusion processes, providing insights that could enhance the performance of lithium-ion batteries. Journal: *ScienceDirect Publication: Nano Energy*
- **Role of Wadsley Defects and Cation Disorder to Enhance MoNb12O33 Diffusion** — score: 1.000 The study explores how Wadsley defects and cation disorder in MoNb12O33 enhance lithium ion diffusion in anodes for lithium-ion batteries. Through comparative analysis and computational modeling, it was found that these defects facilitate faster lithium transport by promoting the occupation of rapid diffusion sites at lower lithiation levels, resulting in significant improvements in battery performance. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **Heterointerfacial Octa-H-Bonded NH4+ Storage in Four-Electron-Transfer Organic–Inorganic Hybrids for Superior All-Organic Batteries** — score: 0.900 The study presents a novel nitroaromatic@MXene heterostructure designed to enhance NH4+ storage and improve the performance of all-organic aqueous batteries. By integrating 1,3,6,8-tetranitropyrene with MXene, the hybrid electrode exhibits exceptional energy density of 182.3 Wh kg−1 and remarkable cycling stability of 60,000 cycles, addressing challenges related to charge transfer and solubility in organic battery materials. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **Multiscale Interfacial Regulation for Stable Zinc Anodes: From Fundamental Mechanisms to Practical Applications** — score: 0.800 The review discusses the challenges of zinc anodes in aqueous zinc-ion batteries, particularly dendrite formation and side reactions. It highlights the innovative approach of multiscale interfacial regulation, which involves creating multilayer structures to enhance protection and optimize ion transport, ultimately improving the performance and stability of zinc anodes and related components, while also addressing future research needs for advancing this technology. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **Resolving the true origin of mossy morphology in aqueous Zn batteries** — score: 0.800

This study identifies the slow interlayer diffusion rate of zinc atoms as the cause of mossy morphology observed in aqueous Zn batteries. Through theoretical calculations and experimental characterization, the authors clarify the underlying mechanisms responsible for inefficient zinc deposition, which affects battery performance. Journal: *RSC - EES Batteries latest articles*

- **In situ construction of multifunctional metaphosphate interphase enabling stable zinc anode with fast Zn2+ transport kinetics** — score: 0.800 The article discusses the development of a high-performance metaphosphate interphase for zinc anodes, which enhances zinc ion transport and promotes stable deposition. This innovative layer allows the zinc anodes to maintain high current densities for extensive periods, significantly improving the longevity and efficiency of zinc batteries. Journal: *RSC - EES Batteries latest articles*
- **Redox aspects of lithium-ion batteries. Is graphite an anode?** — score: 0.800 The article discusses the redox mechanisms involved in lithium-ion batteries, specifically focusing on the role of graphite as an anode material. It explores the charging processes of graphite electrodes from an electrochemical perspective, presenting insights into their functionality and implications for battery performance. Journal: *RSC - EES Batteries latest articles*
- **LiNO2 Additive Enables Faster Formation of Li3N-Rich Interphase with High Ionic Conductivity for Cycling Stable Lithium Metal Battery** — score: 0.800 This study introduces LiNO2 as an innovative electrolyte additive that enhances the formation of a lithium nitride (Li3N)-rich solid electrolyte interphase (SEI) in lithium metal batteries. By favoring the decomposition into Li3N over less conductive compounds, LiNO2 significantly improves interfacial ion transport, leading to remarkably stable battery performance with extended cycling life and high efficiency compared to traditional additives. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **[ASAP] Interfacial Kinetics, Not Solvation Thermodynamics, Govern the Reversibility of Sodium Metal Batteries** — score: 0.800 The study highlights that the reversibility of sodium metal batteries is primarily controlled by interfacial kinetics rather than solvation thermodynamics. This finding emphasizes the critical role of reaction rates at the interface in battery performance, challenging previous assumptions that focused on thermodynamic factors. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **[ASAP] Mechanistic Insights into Dendrite Growth in Aqueous Zinc-Ion Batteries with Trace Propylene Carbonate Electrolyte Additive** — score: 0.800 The article investigates the mechanism of dendrite growth in aqueous zinc-ion batteries enhanced by the addition of trace amounts of propylene carbonate to the electrolyte. It presents findings that elucidate how this additive influences dendrite formation, potentially leading to improved battery performance and longevity. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **[ASAP] Interface-Mediated Jahn–Teller Effect in a Structure-Reinforced LiMnO2 Cathode** — score: 0.800 The article investigates the interface-mediated Jahn–Teller effect in a structure-reinforced LiMnO2 cathode, highlighting how these modifications can enhance the performance and stability of lithium-based batteries. The study provides insights into the relationship between structural reinforcement and electrochemical behavior, paving the way for improved battery materials. Journal: *Journal of the American Chemical Society: Latest Articles (ACS Publications)*
- **Coupling X-ray computed tomography with digital volume correlation to study core collapse in lithium-ion batteries** — score: 0.800 The article discusses the integration of X-ray computed tomography with digital volume correlation to investigate the phenomenon of core collapse in lithium-ion batteries. This innovative approach enhances the understanding of mechanical behaviors within batteries, aiding in the development of better numerical models for performance analysis. Journal: *RSC - EES Batteries latest articles*
- **Predicting the formation of mud cracks in Li-ion battery electrodes during the drying process with in situ X-ray computed tomography** — score: 0.800 The article discusses a study focusing on the prevention of mud crack formation in Li-ion battery electrodes during the drying process, which can significantly affect their performance. Utilizing in situ X-ray computed tomography

and digital volume correlation, researchers pinpointed the exact timing of crack initiation, providing insights for improving electrode manufacturing. Journal: *RSC - EES Batteries latest articles*

- **Design guidelines to use optical fibers as state of charge sensors: an operando micro wide and small angle X-ray scattering study of an IR-fiber equipped smart Na-ion battery** — score: 0.800 The article investigates the use of optical fibers as sensors for state of charge in Na-ion batteries through an operando micro wide and small angle X-ray scattering study. By analyzing data from a fiber-equipped battery system, the research identifies biases in determining state of charge, contributing to the development of design guidelines for improved sensor accuracy. Journal: *RSC - EES Batteries latest articles*
- **The Significant In-Plane Heterogeneity of Cathode Performance in Aged Lithium Iron Phosphate Batteries: Modeling and Mitigation Method** — score: 0.800 The article discusses the pronounced in-plane heterogeneity in the performance of aged lithium iron phosphate batteries, highlighting the impact of this variability on efficiency. It presents a modeling approach to understand the performance discrepancies and offers potential mitigation strategies to enhance battery consistency and lifespan. Journal: *ScienceDirect Publication: Energy Storage Materials*
- **Structural descriptors controlling pore-filling mechanism in hard carbon electrode during sodiation** — score: 0.700 The article investigates the impact of distinct carbon nanopore structures on the sodiation process in hard carbon electrodes, providing a predictive model for the voltage plateau and capacity observed during sodium storage. The findings align with experimental data, enhancing understanding of pore-filling mechanisms in sodium-ion batteries. Journal: *RSC - EES Batteries latest articles*
- **Initial characterization and cycling of two batches of commercial hard-carbon/NaxNiyFezMn1−y−zO2 sodium ion 18650 batteries as a potential replacement for lithium-ion batteries** — score: 0.700 The article analyzes two commercially available sodium-ion 18650 battery models from Tycorun and Hakadi, both utilizing the same layered oxide cathodes and hard carbon anodes. It focuses on their initial characterization and performance cycling, highlighting their potential as alternatives to traditional lithium-ion batteries. Journal: *RSC - EES Batteries latest articles*
- **Constructing Highly Ion-Conductive Composite Solid Electrolytes via Crosslinking Strategy for Advanced Room-Temperature Lithium Metal Battery** — score: 0.700 This article details the development of a highly ion-conductive composite solid electrolyte by integrating Li10GeP2S12 (LGPS) and cationic metal-organic frameworks (MOFs) into a modified poly(ethylene oxide) matrix. The resulting electrolyte showcases impressive performance with a lithium ion conductivity of 6.9 × 10−4 S cm−1 and long-term stability in battery cycles, significantly advancing the potential for high-performance all-solid-state batteries. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **An internal–external dual-modification strategy for enhancing interfacial stability and ionic transport in LATP-based solid-state electrolytes** — score: 0.600 The article introduces an innovative dual-modification approach that enhances both the structural integrity and interfacial characteristics of LATP-based solid-state electrolytes. This method aims to improve ionic transport, making significant strides in the development of more efficient solid-state batteries. Journal: *RSC - EES Batteries latest articles*
- **Li0.95Na0.05FePO4 as a trifunctional additive to boost the electrochemical performance of cathodes in lithium–sulfur batteries** — score: 0.600 The article presents Li0.95Na0.05FePO4 (LNFP) as an effective additive for lithium-sulfur battery cathodes, enhancing their electrochemical performance. It facilitates rapid ion migration and improves polysulfide management through adsorption and catalytic conversion, leading to superior battery efficiency. Journal: *RSC - EES Batteries latest articles*
- **Large-Capacity Rechargeable Silicon–Hydrogen Gas Battery** — score: 0.600 The newly developed silicon–hydrogen gas (Si–H2) battery integrates a nano silicon anode with hydrogen evolution and oxidation reactions, achieving a high discharge capacity of approximately 3400 mAh g−1 and demonstrating excellent performance across a wide temperature range (10°C to 80°C). With over 100

cycles and the ability for high-rate charge/discharge at 60°C, this battery design highlights a significant advancement in energy storage technology, leveraging both silicon and hydrogen effectively. Journal: *Wiley: Advanced Energy Materials: Table of Contents*

- **Dual-Functional Interface Locking Strategy: Simultaneously Regulating Anode Microenvironment and Trapping Iodide Species for Ultrastable Zn-I2 Batteries** — score: 0.600 The article presents a dual-functional interface locking strategy designed to enhance the performance of Zn-I2 batteries. This method effectively regulates the anode's microenvironment while simultaneously trapping iodide species, contributing to the batteries' ultrastable operation. Journal: *ScienceDirect Publication: Energy Storage Materials*
- **[ASAP] Electrolyte and Electrode Interfacial Model: Five Years' Research Progress and Perspectives** — score: 0.600 The article reviews five years of research on the interfacial interactions between electrolytes and electrodes in energy storage systems, highlighting advancements in model development and significant findings that have implications for improving battery performance. It also discusses future research directions and challenges in this field. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **Electrolyte design curbs side reactions** — score: 0.600 The article discusses a novel hybrid eutectic aqueous-organic electrolyte that mitigates side reactions in aqueous zinc-ion batteries, addressing the issue of zinc corrosion caused by acidic conditions. This advancement allows for more efficient and durable cycling of Zn‖MnO2 systems, enhancing the viability of these batteries for high-energy grid storage applications. Journal: *Nature Energy*
- **[ASAP] The Hidden Complexities of Electrochemically Active Surface Area Measurements** — score: 0.600 The article examines the complexities and challenges involved in measuring electrochemically active surface area (ECSA), highlighting how various factors can influence the accuracy and reliability of these measurements. It emphasizes the necessity for a better understanding of these complexities to improve characterization methods in electrochemical research. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **[ASAP] Multi-Electron Redox Bipolar Small Molecule with Zn2+-Mediated Stabilization for Aqueous Zinc-Organic Batteries** — score: 0.600 The article discusses the development of a novel multi-electron redox small molecule that is stabilized by Zn2+ ions for use in aqueous zinc-organic batteries. This stabilization enhances the efficiency and performance of the batteries, showcasing potential advancements in sustainable energy storage solutions. Journal: *ACS Applied Energy Materials: Latest Articles (ACS Publications)*
- **Interface Engineering Principles for Hard Carbon Anodes in Sodium-Ion Batteries: From Mechanisms to Synergistic Strategies** — score: 0.600 The article reviews the interface engineering principles relevant to hard carbon anodes in sodium-ion batteries (SIBs), highlighting their effective mechanisms and synergistic strategies that enhance performance for large-scale energy storage applications. It emphasizes the advantages of sodium-ion technology, including cost-efficiency and safety, while advocating for innovative approaches to optimize hard carbon materials. Journal: *RSC - Energy Environ. Sci. latest articles*
- **Physics-informed machine learning exploration of Na storage mechanisms in disordered carbon** — score: 0.600 This article investigates the sodium storage mechanisms in disordered carbon materials using a physics-informed machine learning approach. The study, published by a team of researchers in "Energy Storage Materials," aims to enhance understanding of how sodium interacts with these materials, potentially improving energy storage technologies. Journal: *ScienceDirect Publication: Energy Storage Materials*
- **Sulfide-Based Electrolytes for All-Solid-State Sodium Batteries** — score: 0.600 This review explores the potential of sulfide-based solid electrolytes in all-solid-state sodium batteries, highlighting their high ionic conductivity and compatibility with sodium systems for energy storage applications. It addresses key challenges—such as moisture sensitivity and interfacial stability—that impede their

practical use, and provides insights into synthesis methods, optimization strategies, and safety concerns critical for scaling up production. Journal: *Wiley: Advanced Energy Materials: Table of Contents*

- **[ASAP] Tailoring the Electrical Double Layer and Interfacial Electric Field with Diverse Configurational Entropy-Driven Electrolyte for Ultrastable Zinc Metal Anodes** — score: 0.600 The article discusses advancements in enhancing the stability of zinc metal anodes by manipulating the electrical double layer and interfacial electric field through electrolytes with varying configurational entropy. This tailored approach aims to improve the performance and longevity of zinc batteries, addressing challenges commonly faced in this area. Journal: *Journal of the American Chemical Society: Latest Articles (ACS Publications)*
- **Mn3O4 and its hybrids as anode active materials for lithium-ion batteries: a review** — score: 0.500 The review article examines the potential of Mn3O4 and its hybrid configurations as anode materials for lithium-ion batteries, highlighting their advanced structural properties and the role of optimized morphologies and conductive frameworks in enhancing electrochemical performance. The authors assess various approaches to improve the effectiveness of these anodes in energy storage applications. Journal: *RSC - EES Batteries latest articles*
- **Impact of Moisture Exposure on Thermal Stability and Safety of Solid-State Batteries** — score: 0.500 This study investigates the impact of moisture exposure on the thermal stability of sulfide-based solid-state batteries, focusing on Li3PS4 (LPS) as a key electrolyte. It reveals that even low humidity levels can trigger detrimental reactions that produce toxic H2S and lead to thermal instability, emphasizing the importance of moisture control in ensuring the safety and effectiveness of these next-generation energy storage systems. Journal: *Wiley: Advanced Energy Materials: Table of Contents*
- **[ASAP] ALD-Engineered ZnO Gradient-Doped Coating for Enhanced Carbon Compatibility and Stability of Nickel-Rich Cathodes** — score: 0.500 The article discusses the development of an atomic layer deposition (ALD) engineered ZnO coating designed to improve the carbon compatibility and stability of nickel-rich cathodes. This innovative coating geometry aims to enhance the overall performance of energy storage systems by addressing common degradation issues associated with such cathodes. Journal: *ACS Applied Energy Materials: Latest Articles (ACS Publications)*
- **[ASAP] Taming Chemical Reactions in Batteries by Noncovalent Interactions** — score: 0.400 The article discusses a novel approach to control chemical reactions in batteries through the use of noncovalent interactions. This method aims to enhance battery performance and stability by fine-tuning the molecular interactions within the electrochemical environment, potentially leading to more efficient energy storage solutions. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **[ASAP] Arginine as an Effective Electrolyte Additive for Dual-Interface Stabilization in Li–S Batteries** — score: 0.400 The article discusses the use of arginine as an electrolyte additive in lithium-sulfur (Li-S) batteries, highlighting its effectiveness in stabilizing the dual-interface. This innovation aims to enhance battery performance and longevity by improving the overall electrochemical properties of the system. Journal: *ACS Applied Energy Materials: Latest Articles (ACS Publications)*
- **[ASAP] High-Energy Quasi-Solid-State Lithium–Sulfur Batteries Based on Electrostatic–Nucleophilic Synergy** — score: 0.400 The article discusses the development of high-energy quasi-solid-state lithium-sulfur batteries that utilize a novel electrostatic-nucleophilic synergy approach. This innovative design potentially enhances the batteries' performance and stability, signaling advancements in energy storage technology. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **Zwitterionic -Molecule-Driven Synergistic Coupling of Dual OER Pathways and Interfacial Water Dynamics for Efficient Alkaline Water Electrolysis** — score: 0.400 This study presents a novel approach to efficient alkaline water electrolysis by utilizing zwitterionic arginine to enhance oxygen evolution reaction (OER) pathways and interfacial water dynamics. The integration of dual mechanisms—adsorbate evolution and lattice oxygen—facilitates greater catalysis efficiency, resulting in significantly reduced overpotentials and prolonged stability for the Arg@FeNiOOH catalyst, demonstrating a promising strategy for overall water splitting. Journal: *Wiley: Advanced Energy*

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- **Zwitterionic Hydration-Network Engineered Gel Electrolytes: Ion-Channel Optimization for Advanced Flexible Zinc-Air Batteries** — score: 0.400 This article discusses the development of zwitterionic hydration-network engineered gel electrolytes aimed at optimizing ion channels for enhanced performance in flexible zinc-air batteries. The authors present novel strategies to improve ionic conductivity and battery efficiency, which could lead to significant advancements in energy storage technology. Journal: *ScienceDirect Publication: Energy Storage Materials*
- **[ASAP] Engineering Vertically Aligned MoS2 Nanosheets on Porous Carbon Support for Accelerated Reaction Kinetics in Lithium–Sulfur Batteries** — score: 0.400 The article discusses the development of vertically aligned molybdenum disulfide (MoS2) nanosheets on a porous carbon support, aimed at enhancing the reaction kinetics in lithium-sulfur batteries. This innovative engineering approach potentially improves battery performance by optimizing the electrochemical reactions involved. Journal: *Energy & Fuels: Latest Articles (ACS Publications)*
- **[ASAP] Dynamic Anode/Cathode–Electrolyte Interface Induced through Polymer Evolution for Durable Lithium Metal Batteries** — score: 0.400 The article discusses the enhancement of lithium metal battery performance through the development of a dynamic interface between the anode, cathode, and electrolyte via controlled polymer evolution. This novel approach aims to improve the durability and efficiency of lithium metal batteries, addressing common challenges related to stability and lifespan. Journal: *Journal of the American Chemical Society: Latest Articles (ACS Publications)*
- **Battery Aging Assessment: From Critical Insights to Enhanced Diagnosis** — score: 0.400 This article presents a comprehensive evaluation of factors impacting battery health diagnosis and lifespan prediction, highlighting the challenges in accurately assessing battery aging. The authors aim to improve methodologies for diagnosing battery conditions and enhancing the reliability of cycle life estimations in energy storage systems. Journal: *RSC - Energy Environ. Sci. latest articles*
- **[ASAP] Dynamically Adaptive Interfacial Chemistry via Molecular Programming for Sustainable Zn Batteries** — score: 0.400 The study discusses a novel approach to enhance the performance of zinc batteries through dynamically adaptive interfacial chemistry utilizing molecular programming. This method aims to improve the sustainability and efficiency of energy storage systems by allowing the battery interface to adapt to changing conditions, thereby optimizing the battery's overall functionality and lifespan. Journal: *Journal of the American Chemical Society: Latest Articles (ACS Publications)*
- **Electrografting solid polymer electrolytes for separator-less structural sodium batteries** — score: 0.300 The article discusses the advancement of sodium ion batteries (SIBs) through the electrografting of solid polymer electrolytes, which eliminates the need for separators in battery design. This innovation aims to enhance the energy density of SIBs, leveraging the affordability and abundance of sodium to improve energy storage solutions. Journal: *RSC - EES Batteries latest articles*
- **[ASAP] A Multilevel Hyperheuristic Optimization Algorithm Framework for Online Parametrization of an Electrochemical Impedance Model on Lithium-Ion Batteries** — score: 0.300 The article presents a novel multilevel hyperheuristic optimization algorithm designed for the online parametrization of electrochemical impedance models specifically for lithium-ion batteries. This framework aims to enhance the efficiency and accuracy of battery performance modeling, contributing to advancements in energy storage technology. Journal: *Energy & Fuels: Latest Articles (ACS Publications)*
- **Porous Graphene Confined Partial Ion Desolvation in Ether Electrolyte for Highly Reversible Sodium Storage** — score: 0.300 This article discusses the development of a porous graphene structure that facilitates partial ion desolvation in ether-based electrolytes, promoting efficient sodium storage. The innovative approach aims to enhance the reversibility of sodium ion batteries, potentially leading to advancements in energy storage technologies. Journal: *ScienceDirect Publication: Energy Storage Materials*

- **[ASAP] Protective Solid Interphase via Composite Additives for Long-Life Aqueous Zinc Batteries** — score: 0.300 The article discusses the development of a protective solid interphase in aqueous zinc batteries through the use of composite additives. This advancement aims to enhance the longevity and efficiency of these batteries by improving their electrochemical stability and mitigating issues related to dendrite formation. Journal: *ACS Energy Letters: Latest Articles (ACS Publications)*
- **S/Cl Co-doped Biomass-Derived Carbon Electrocatalysts: Low ΔE of 0.58 V for ORR/OER and Application in High-Performance Zinc-Air Batteries** — score: 0.300 The article discusses the development of sulfur and chlorine co-doped biomass-derived carbon electrocatalysts, which demonstrate a low overpotential of 0.58 V for the oxygen reduction and evolution reactions (ORR/OER). These findings suggest promising applications for enhancing the performance of zinc-air batteries. Journal: *ScienceDirect Publication: Nano Energy*