

KEEPING UP WITH BATTERIES

















We have sifted through >1000 of articles on Li-ion batteries for you! We have captured pretty much everything new and relevant that came out in *September 2018*. We have carefully selected and categorized each article, added some interesting news, and squeezed all this content into our comprehensive review.

Hope it makes your work easier and keeps you in touch with battery literature!









The Research Interfaces Team

CELL COMPONENTS & MANUFACTURING








 Li-ion battery safety	Elsevier				book
★ Impact of different electrode coating defects on cell performance	Elsevier		NMC/G		★
Processing vs surface free energy of composite electrodes	ECS		NMC/G		
Cost evaluation of EV cathodes operating at high voltages	Elsevier				
Economic and environmental evaluation of cathodes for EV batteries	Springer				chapter
Interfacial resistance between cathode and current collector by EIS	Elsevier				
★ Optimizing formation protocols for NMC811/graphite cells	Elsevier		NMC/G		★
Si composite slurry mixing using ZrO ₂ balls	Elsevier		Si, SSB		
Optimizing parameters of spray-printed battery electrodes	Elsevier		LFP/LTO		
Fabrication of flexible Ni current collector by inkjet printing	MDPI				
3D printing of complete Li-ion battery using FFF printer	ACS		SSB		
 Microwave reactors for synthesis of nanomaterials	MDPI				
 Electrospinning of nanofibers and nanocomposites	Elsevier				
 Nanocomposite materials produced by electrospinning	Elsevier				

LEGEND

-  – link to the article or website
-   ★ – OA/review/highlight article
-   – work led by industry/national lab
-    – led by prominent company or government/academic research lab

TYPES OF LI-ION BATTERIES




-  – application / Li-ion chemistry
-   – electric vehicles / grid storage
-   – recycling / resources
- Si, G, LiM, LTO... – anode chemistries
- NMC, NCA, LFP... – cathode chemistries

*Other abbreviations are chemistry or engineering specific and commonly used throughout the field (e.g. KF = Kalman filter). If you are unclear, please click on the link and check.

**Mistakes are unavoidable, so please forgive us if you find any.

CELL BEHAVIOR



 Li-ion battery safety	Elsevier				book
Thermally-induced failure of Li-ion cell modelled by COMSOL	ECS				
Composite tshell elements for accelerated battery safety simulations	ECS				

🔍 Models of Li-ion battery aging in different scales	Elsevier				🔍
★ Numerical study of T-dependent aging behavior of Li-ion cell	Elsevier				★
OCV–SoC characteristics of 75Ah battery at different T	MDPI	🏢	NMC	🔒	
Performance of 20Ah Li-ion pouch cell cooled by cold plates	MDPI		🚗	🔒	
Effect of dynamic impacts on behavior and aging of LCO cells	Elsevier		LCO		
Effect of packaging/cooling plates on mechanical failure of EV module	Elsevier	🏛️	🚗		
Influence of AC current ripples on life-time of Li-ion cells	IEEE		🚗		
Separated impedance spectra of anode and cathode via 3-electrode cell	Elsevier	🎓🏢	NMC/G		
Interfacial resistance between cathode and current collector by EIS	Elsevier			🔒	
Nonlinear electrochemical impedance spectroscopy of Li-ion cell	ECS		NMC/G	🔒	
★ Optimizing formation protocols for NMC811/graphite cells	Elsevier	🏛️	NMC/G		★
Consumer-based evaluation of commercially available 18650 cells	MDPI			🔒	

📱 NEWS BOX



The World Bank Just Placed a \$1 Billion Bet on Batteries ([Fortune](#))

"The World Bank will offer loans up to \$1 billion and seek partners for an additional \$4 billion to finance batteries in the developing world."

A "Technology-Smart" Battery Policy Strategy for Europe ([Science](#))

"Europe houses less than 1% of the global Li-ion battery cell manufacturing capacity, and this production capability largely addresses niche markets."

Argonne's Joint Center for Energy Storage Research Renewed for 5 Years ([Energy.gov](#))

📄 BATTERY MANAGEMENT



🔍 ★ Models of Li-ion battery aging in different scales	Elsevier				🔍 ★
Method for predicting critical temperature of Li-ion cell	Elsevier				
Nonlinear electrochemical impedance spectroscopy of Li-ion cell	ECS			🔒	
Fast charging method with time-varying current	Elsevier				
🔍 SoH and RUL estimation methods for EV battery	Elsevier		🚗		🔍
Comparison of lumped diffusion models for voltage prediction	Elsevier		🚗		
Estimation of model parameters using universal adaptive stabilizer	IEEE			🔒	
Validating ECMs at low ambient temperatures	MDPI		🚗	🔒	
State estimation using fractional-order ECM	Elsevier		🚗		
★ Comparison of co-estimation methods for online SoC	Elsevier				★
Online identification of parameters and SoC estimation using DUKF	Elsevier		🚗		
SoC and model parameters estimation using HEKF	Elsevier		🚗		

Nonlinear T-dependent state model for SoC estimation with EKF	MDPI			
SoC estimation based on EKF and EC-based ECM	MDPI			
SoC estimation using physically-based impedance model	IEEE			
SoC estimation via frequency-dependent capacitance	MDPI			
SoC estimation using adaptive estimator	Elsevier			
SoC estimation based on parameter adaptive method with dead zone	Elsevier			
SVR algorithm for ICA-based SoH estimation	MDPI			
SoC prediction of Li-polymer battery for HEV	MDPI			
Aging and SoH of second-life LFP batteries for energy storage	Elsevier			
Parameter identification of battery pack based on CRB analysis	Elsevier			
Comparison of different resampling algorithms for RUL prognosis	Elsevier			

BATTERY MODULES & PACKS

Li-ion battery safety	Elsevier				book
Insulation fault diagnosis for EV battery pack	Elsevier				
Effect of packaging/cooling plates on mechanical failure of EV module	Elsevier				
★ Influence of cell-to-cell variations on inhomogeneity of battery module	ECS				★
Statistics-based fault detection of series-connected EV battery pack	Elsevier				
Balancing of battery strings using mesh-structured SCE	IEEE				
Dynamics of current distribution in parallel-connected battery cells	Elsevier				
★ Understanding cell variations in battery pack due to T non-uniformity	Elsevier				★
Hybrid characterization of battery packs based on time and frequency	Elsevier				
Cell selection and grouping method for second-life cells	Elsevier				
Simulation platform for optimization of EV modular drivetrains	IEEE				
🔍 ★ Thermal management systems for modular EV battery packs	Elsevier				🔍 ★
Optimizing control variables in TMS using design of experiments	Springer				
Thermal and energy management based on bimodal T sensing and ML	MDPI				
Transient thermal behavior of open vs confined air-flow module	Elsevier				
Integrating jet inlets and vortex generators to improve pack air cooling	ASME				
🔍 Review of PCM- and TEC-based thermal management systems	Elsevier				🔍
Comparing FAC and SP heating strategies for PCM-based battery pack	Elsevier				
TMS based on PCM-fin structure	Elsevier				
TMS for AUV based on paraffin PCM	Elsevier		AUV		
TMS based on serpentine-channel cold plate	Elsevier				
Performance of 20Ah Li-ion pouch cell cooled by cold plates	MDPI				
Internal AC/DC self-heating strategy for EV battery pack	Elsevier				

 NEWS BOX

Mercedes Unveils Electric Car in Direct German Challenge to Tesla ([Reuters](#))




















Elon Musk Steps Down as Tesla Chairman in \$40 Million SEC Settlement ([Time](#))

States, Cities and Companies Unveil a Frenzy of New Electric Vehicle Commitments ([Greentech Media](#))



 BATTERY APPLICATIONS



Li-ion battery safety	Elsevier				book
Macromodeling of microbatteries for IoT integration	Springer			micro	chapter
Modular and scalable battery systems for EVs	Springer				
★ Simulation platform for optimization of EV modular drivetrains	IEEE				★
Analysis of energy consumption of different EV powertrains	Springer				
Energy management strategy for battery/SC system in PHEV bus	Elsevier			bus	
TEA diagram for cost and emission comparison of hybrid and EV	MDPI				
Active stabilization of bidirectional EV battery charger	IEEE				
MMPC for bidirectional power control between EV and grid	IEEE				
Charging solutions for everyday EV mobility	Springer				
Charging management for EVs using generalized Nash equilibrium	Wiley				
Mixed user equilibrium model of EV charging in urban network	Elsevier				
Charging control of EVs in smart grid using Stackelberg differential game	Springer				
Incentive-based distributed scheduling of EV charging	IEEE				
Consensus-based coordination of EV charging	Elsevier				
★ Emissions of centralized vs decentralized EV smart charging	Elsevier				★
Effect of opportunity charging on costs/CO ₂ of urban freight transport	MDPI		truck		
Locating and sizing of battery swapping stations	Elsevier				
Multi-objective locating of EV battery swapping stations	Elsevier				
Dial-a-ride problem with EVs and battery swapping stations	Elsevier				
Analysis of EV driving patterns via two-level clustering model	Elsevier				
Modular approach for electrification of city bus fleets	Springer		bus		
Planning EV infrastructure for urban areas with tight land supply	MDPI				
Placing EV charging stations using time cost and existing infrastructure	MDPI				
★ Integration of EVs into power grid for demand response	Elsevier				★
Evaluating impact of EVs on grid assets using integrated algorithm	Elsevier				
Resolving grid congestion in Germany using V2G technology	Elsevier				

Transportation and power grid in smart cities	Wiley				book
Past and future industrial use of lithium in EU context	MDPI				
Different aspects of energy storage	IEEE				issue
Optimizing demand-side ESS in presence of distributed generation	IEEE				
Coordinated control of multiple BESS for primary frequency regulation	IEEE				
Dual battery storage strategy for PV utilization in UK	MDPI				
Sizing of residential battery/PV system in Australia	Elsevier				
Optimizing dispatch of integrated battery/PV system	IEEE				
Energy management algorithm for battery/PV system	IEEE				
Optimization model for battery/PV systems in P2P energy trading	Elsevier				
Economic evaluation of second-use battery/PV charging station	Elsevier				
Key environmental and performance indicators for battery/RE system	Elsevier				
Optimizing size and control of off-grid battery/RE system	Elsevier				
Energy management for battery/wave energy system	Elsevier				
★ Techno-economic analysis of Li-ion vs Pb-acid battery in microgrids	Elsevier				★
Design of multi-energy microgrid using linear battery aging model	Elsevier				
Energy management and battery sizing for Flinders Island microgrid	Elsevier				
LCA and cost-benefit analysis of BSS for small energy communities	MDPI				
Techno-economic analysis of DC distribution in commercial buildings	Elsevier				

RECYCLING

★ Processes and technologies for recycling of spent Li-ion batteries	Springer			★
Hydrometallurgical processes for recycling spent Li-ion batteries	ACS			
Recovery of Li, Co, Ni, Mn from cathode scrap by leaching	Elsevier			
Recovery of high-purity Co from NMC battery by leaching	Springer			
Leaching and precipitation of Li and Co using tartaric acid	Elsevier			
Effect of mechanochemical activation on LCO powder and metal leaching	ACS			
Recovery of metals from NMC cathode using H ₂ SO ₄ leaching	Elsevier			
Recovery of Mn from H ₂ SO ₄ leaching liquor	Elsevier			
Selective extraction of Li using mild H ₃ PO ₄	Elsevier			
Techno-economic optimization of battery metal recovery by acid leaching	Elsevier			
Recovery of Li from pyrometallurgical slag by chlorination roasting	ACS			
★ Coupling reactions during roasting of mixed anode and cathode	Elsevier			★
Computational selection of LIMO ion exchange materials for Li extraction	ACS			
Recovery of NMC cathode material from different recycling streams	ACS			
Regeneration of NMC532 cathode material from spent batteries	Elsevier			
Closed-loop process to resynthesize LiCoO ₂ from spent phone batteries	Elsevier			
Economic and environmental benefits of EV recycling in China	Elsevier			

 NEWS BOX

Electric Flight Will Transform Our Cities for the Better, and It Will Happen Sooner Than You Think ([Greentech Media](#))

"This trio of storage, sensors and software came together to build today's \$6 billion commercial drone industry. Only 10 years ago, it barely existed. Once drones are allowed to fly beyond visual line-of-sight, the market is expected to grow at an even faster pace."

New Electric Drone Has Groundbreaking Flight Time ([IEEE Spectrum](#))

Industry Giants Samsung and Hyundai Invest in Solid-State Batteries ([Greentech Media](#))

Why Lithium-ion May Rule Batteries for a Long Time to Come ([MIT Technology Review](#))

"For anything to make it into a commercial product is a long slog, even if you make the discovery faster. It's just a very long road to materials optimization, testing, customer acceptance, all of these things. To the point that even if I had something that worked perfectly in the lab today, you would probably have a six-to-10-year slog."