

From idea to battery

Workshops on Electrolytes, Compatibility Studies, and Performance Optimization

Content

“At E-Lyte, working efficiently with our partners and customers is a top priority. Achieving this requires a deep, holistic understanding of electrolytes, their interactions with other cell components, and their applications. With the experience we’ve gained over many years, we’re proud to offer tailored workshops that provide the ideal foundation for successful collaboration thus fostering the market entry of our customers.”

— Dr. Kolja Beltrop,
Co-Founder and CTO of E-Lyte



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E-Lyte in a nutshell

E-Lyte is a leading European company specialized in the development and production of electrolyte solutions for innovative energy storage technologies such as lithium ion batteries, sodium ion batteries, next-generaation cell chemistries and supercaps.
Since 2019, E-Lyte has been supplying industrial and research partners around the world with products of the highest quality. The E-Lyte brand stands for reliable, high-performance electrolyte solutions used in both commercial series production and advanced research projects.

In 2024, E-Lyte opened a state-of-the-art production facility in Kaiserslautern, Germany, with an annual capacity of 20,000 tons—setting new industry standards in electrolyte manufacturing. Since its foundation in 2019, E-Lyte has performed more than 150 development projects with either the chemical industry focusing on the technological and economical benchmarking of new components for the application in electrolytes or the cell manufacturer industry for which tailored electrolytes have been developed. The projects were ranging for the application in medical devices, drones to electric vehicles.





Benefits of our workshops

Bridging theory and practice

While academic courses mostly focus on theoretical concepts, our workshops emphasize real-world applications as well as requirements and problems of electrolyte and cell manufacturers. In the workshop, we address common electrochemical and analytical techniques with their data interpretation to understand the performance and compatibility of the electrochemical components or systems using tailor-made electrolyte solutions.

Shaping the future of battery technology

Our workshops provide valuable insights into the latest technology and market trends in energy storage technologies, covering next-generation battery chemistries and innovative electrolyte solutions. With deep expertise in addressing the challenges of cell manufacturers and strong understanding of latest developments from material suppliers, we support our customers in entering the market and bringing cutting-edge energy storage solutions to life.

Experience next-level techniques

Our workshop participants gain practical skills in formulating electrolytes, performing analytical methods, building laboratory test cells, conducting electrochemical testing methods as well as understanding the compatibility of electrolytes with their components/ systems — skills that are relevant for research and industry.
Further, you will understand how cell manufacturere for dedicated applications such as electric vehicles, drones or energy storage systems are testing cells and developing products.

Economic relevance

At E-Lyte, we understand the challenges faced by cell manufacturers, the market, the cost position and are well-versed in the latest innovations from material suppliers. In addition, we support our customers in successfully bringing their products to market.

Solutions we provide

Lab-to-Real-World gap

Transforming research results into scalable, industry-ready solutions can be challenging. E-Lyte's workshops tackle this issue by providing practical methodologies and real-world case studies, ensuring a smooth transition from innovation to implementation.

Optimizing experimental design

Many challenges arise from poorly designed experiments that fail to yield actionable insights. E-Lyte workshops guide participants in developing robust experimental designs, ensuring that tests are structured for reliable, reproducible results and meaningful data interpretation to readily tackle the market.

Standardizing testing protocols

Inconsistent testing methods often result in irreproducible and unreliable outcomes. E-Lyte workshops address this issue by utilizing standardized protocols to ensure the accuracy and reproducibility of electrochemical and analytical measurements.

Interpreting complex data

Misinterpretation of electrochemical and analytical data is a common challenge, often arising from the complexity of analyzing multicomponent systems. E-Lyte workshops are designed to help participants with the skills needed to effectively analyze and extract meaningful insights from complex datasets.



Key advantages of our workshop philosophy

1 Comprehensive understanding of your needs

You are the expert on your product. Our first step is to gain a deep understanding of your product, market solution and current challenges—only then can we develop a customized workshop concept tailored precisely to your needs.

2 Transferring technical competence

Battery cells and electrolytes are complex chemical systems We will give you a broad understanding of the electrolyte itself and the electrochemical reactions occurring in the battery cell. After the workshop, you will expertise in essential electrochemical techniques and understand the fundamentals of electrolytes in various energy storage systems. You will be able to speak the language of batteries.

3 Industry Expertise for tailored benchmark solutions

Gain valuable insights into the latest regulations, market trends, advancements and innovations in energy storage, whether from academia or energy-related industries. This will enable the initiation of a customized study tailored to specific needs, ultimately determining whether a material is suitable for use in battery cells.

4 Networking Opportunities

Connect with electrolyte technology and market experts to exchange insights and engage in comprehensive discussions, ensuring that no question remains unanswered regarding the challenges in your current energy storage applications.

5 Post-workshop support

Gain access to workshop materials for future reference, with the option for follow-up Q&A via email for a specified period, upon request. Additionally, receive support in designing development projects tailored to your needs.

Example of how our workshop works

Duration: Approx. 5 hours, including theory, hands-on practice, Q&A session and guided tour through our E-Lyte laboratories and manufacturing site

Location: On-site in Kaiserslautern or Münster

No. of attendees: Maximum of 20 participants

Included:

- Preparation of the workshop
- Lunch and refreshments
- Mediated by at least one E-Lyte technology expert
- The agenda can be adapted towards the wishes of the customer with regard to starting and ending times
- PDF copy of all seminar presentations
- 1h follow-up Q&A call (one week after the workshop)

Not Included:

- Travel expenses
- Accommodation

Key topics

1. Fundamentals of electrolytes

- Introduction to key electrolyte components: salts, solvents, additives
- Introduction to electrolyte chemistry
- Selection of electrolyte components for performance and safety optimization
- Current trends and advancements in electrolyte components

2. Fundamentals of lithium-ion batteries (LIB)

- Working principle of Li-ion cells
- Application fields, requirements, the market and cell chemistries
- Role of electrolytes in LIBs
- Electrolyte components and selection criteria for performance optimization

3. Fundamentals of sodium-ion batteries (NIB)

- Working principle of a NIB
- Application fields, requirements, the market and cell chemistries
- Role of electrolytes in NIBs

4. Fundamentals of supercapacitors (EDLCs) / Li-ion capacitors (LICs)

- Working principle of supercapacitors/ Li-ion capacitors
- Application fields, requirements, the market and cell chemistries
- Role of electrolytes in EDLCs and LICs

5. Introduction to next-gen batteries

- Introduction to lithium-sulfur (Li-S) batteries
- Introduction to lithium-air (Li-O2) batteries
- Introduction to multivalent batteries (Mg-ion, Zn-ion, Al-ion, K-ion)
- Introduction to all solid state batteries
- Introduction to flow batteries (Iron-air batteries)

6. Performance and safety considerations of electrolytes

- Aspects of electrolyte stability under different operation conditions
- Common electrolyte degradation mechanisms
- Thermal runaway and electrolyte decomposition mechanisms
- Electrolyte impact on battery lifespan and degradation



Key topics

7. Performance and safety considerations of battery cells

- Battery degradation mechanisms (SEI formation, Li plating, dendrite growth, High voltage, elevated temperatures)
- Problems associated with battery aging (Capacity fading, impedance rise)
- Thermal runaway and safety risks (overcharging, short circuit, mechanical abuse)
- Thermal management strategies to prevent overheating in batteries

8. Introduction to innovative and sustainable electrolyte solutions

- Recycling and sustainability in electrolyte production
- Low flammability and low toxicity electrolyte alternatives
- Opportunities and challenges of solid-state and hybrid electrolytes

9. Evaluation of material-electrolyte compatibility

- Material-electrolyte compatibitility in static storage under liquid/gas phase (focus on different polymers and alloys)
- Material-electrolyte compatibility under electrochemical cycling condition (focus on different polymers and alloys)

10. Introduction to electrochemical characterization techniques

11. Introduction to analytical techniques

- Introduction to quality assurance in electrolyte production and testing: Industrial standards and regulatory compliance
- Electrolyte purity analysis and characterization techniques
- Compatibility testing with electrodes and separators

12. Introduction to battery testing standards

- Abuse testing (overcharging, impact, puncture tests according to the standards)
- Compliance with safety regulations (UN and IEC standards)
- EHS for electrolyte handling and storage
- Electrolyte filling techniques and equipment

13. Market perspectives for batteries and electrolytes

- Overview of the global Li-ion battery market and electrolyte demand in volume and value
  - Europe
  - North America
- Role of alternative electrolyte solutions within the energy storage market
- Understanding the battery value chain
- Navigating the regulatory landscape for battery technologies



Visit us at one of our two locations

Our production plant for electrolyte solutions in Kaiserslautern

- Walkthrough of our advanced laboratories, highly automated pilot production line, and revolutionary largescale production facility, showcasing key workstations, analytical equipment and specialized machinery.
- Insights into our quality assurance and safety protocols to ensure high-performance electrolyte solutions.
- Demonstration of our efficient system for material handling and storage processes for optimized production efficiency.
- Opportunity to engage with our skilled technical workforce and ask industry-related questions.

Our research and development facilities in Münster

- Overview of our state-of-the-art chemical laboratories where new formulations and technologies are produced and tested.
- Demonstration of cutting-edge analytical techniques used for product development and quality assurance.
- Demonstration of our electrochemical testing capabilities in facility.
- Discussion on future trends in energy storage and sustainability initiatives.
- Formulating your own electrolyte, evaluating its quality and building your own battery cell.





Let's get started

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