Special Issue

Multiscale Co-Design of Electrode Architectures and Electrolytes

Message from the Guest Editors

Rapid electrification in transportation, aviation, and grid storage requires breakthroughs in energy density, power, and longevity. Achieving this demands a shift from isolated material discovery to the integrated co-design of electrolytes—molecularly engineered solvents, salts, additives, gels, polymers, or solids—and electrode architectures across scales, from particles to devices. This synergy is essential to achieve high-loading, low-tortuosity electrodes, stabilize interphases (SEI/CEI), and maintain compatibility with scalable manufacturing (dry processing, high-solid slurries, calendering, printing). We invite experimental, computational, and data-driven studies that explicitly link material structure and processing to device-level performance under practical conditions. Submissions must report quantitative metrics: areal capacity/loading, electrode thickness/density, porosity/tortuosity, N/P ratio, electrolyte-to-capacity (E/C), stack pressure (if applicable), voltage window, temperature, and full-cell (e.g., pouch, stack) validation. Capacitor studies should include relevant metrics (e.g., ESR, power density).

Guest Editors

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