

# Development of novel electrolyte additives via ex-situ analysis of electrodes

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## **Abstract**

An investigation of the effect of electrolyte on performance of lithium ion batteries will be presented. The electrochemical performance of common electrolyte formulations will be discussed along with detailed ex-situ surface analysis of the cycled electrodes. The ex-situ analysis allows the development of an understanding of the role of the electrolyte and common additives in the structure of interfacial electrode films on both the anode (solid electrolyte interphase, SEI) and on the cathode. Correlation of the structure of the surface films with the performance limiting reactions in lithium ion batteries affords insight into the mechanism of interfacial film formation and function. The mechanistic insight is used to systematically develop novel additives designed for specific electrode surface modification to afford optimized electrochemical performance. The electrochemical performance and ex-situ surface analysis of electrodes cycled with novel Additives for Designed Surface Modification (ADSM) will be presented.