**Electrolyte degradation –**

**Additives and their impacts on cell performance**

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Energy density and durability of lithium-ion batteries improved during recent years. Among other factors, the use of electrolyte additives contributed to a better SEI stability and thus a decrease in loss of cycleable lithium and less parasitic side reactions. Even though the SEI passivates the anode to a certain level, electrolyte and additives are consumed in side reactions on both anode and cathode. These side reactions change the composition and amount of electrolyte, thus influencing overall battery performance.

This contribution explores the ageing pathways of NMC/Graphite pouch cells using different electrolyte compositions. Over 40 cells with three different electrolyte compositions were aged under different conditions to compare the performance of commonly used additives. In addition to these tests, further coin-cell measurements will improve the understanding of electrolyte degradation processes.

Both electrical data, as well as insights in gas evolution of the cells, are presented on this poster. Differential voltage analysis is used to study the ageing mechanisms and the effect of additives on the long-term performance of the batteries. The availability of detailed formation data enables the analysis of correlations between cell behaviour during the initial formation cycle and subsequent performance of the cell during cyclic and calendaric ageing. A basic approach to include electrolyte degradation in a Newman-model will also be presented.