Notes on LG M50LT Open-Circuit Potential (OCP) Data

10 September 2024, About:Energy Ltd

Our own best fit for lithiation bounds when using the provided OCP interpolants is as follows:

SOC 0% (equilibrium at cell voltage 2.5 V, 25 °C):

$x_{Li,pos,max}$ = 0.983

$x_{Li,neg,min}$ = 0.00144

SOC 100% (equilibrium at cell voltage 4.2 V, 25 °C):

$x_{Li,pos,min}$ = 0.1898

$x_{Li,neg,max}$ = 0.88632

We assume pure NMC811 ($Li_xNi_{0.8}Mn_{0.1}Co_{0.1}O_2$) as the positive electrode active material and pure graphite (Li_xC_6) as the negative electrode active material.

We have measured electrode coating thicknesses and estimated active material volume fractions (using the given OCP data and as follows:

L_{neg} = 82.8 μm

L_{pos} = 55.6 μm

φ_{neg} = 0.6854

φ_{pos} = 0.68221

Together with $A_{geom,cell}$ = 1187.8 cm^2 (measured electrode pair coating extent) these give us a theoretical thermodynamic capacity of 4.885 Ah in the voltage window 2.5 V to 4.2 V. OCV fit quality vs our own resistance-corrected pOCV data is shown below (black = measured electrical data, green = fit):

Cell dV/dQ fit quality