

Development of an innovative procedure for lithium plating limitation and characterization of 18650 cycle aged cells for DCFC automotive applications

Matteo Dotoli ^{1,2,*}, Emanuele Milo ^{3,*}, Mattia Giuliano², Arianna Tiozzo ^{1,2}, Marcello Baricco ¹, Carlo Nervi ¹, Massimiliano Ercole ³ and Mauro Francesco Sgroi ^{1,*}

¹ MJL, MEMT, Centro Ricerche Fiat S.C.p.A, Orbassano, 10043 Turin, Italy

² Department of Chemistry, NIS-INSTM-University of Turin, 10125 Turin, Italy

³ Propulsion Systems, FCA Italy SPA, Corso Settembrini 40, 10135 Turin, Italy

* Correspondence: matteo.dotoli@unito.it (M.D.); emanuele.milo@stellantis.com (E.M.); mauro.sgroi@crf.it (M.F.S)

Supplementary Materials

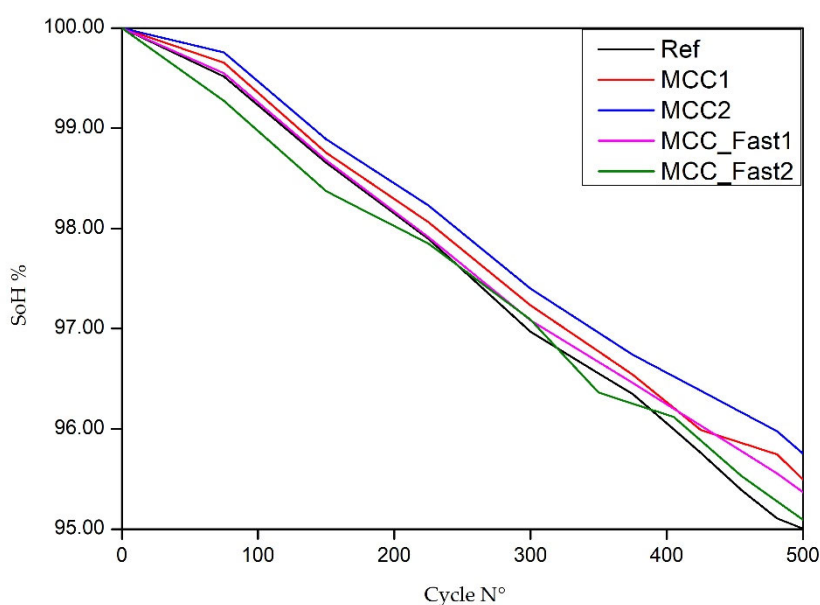


Figure S1 - Cycle aging campaign up to 500 cycles

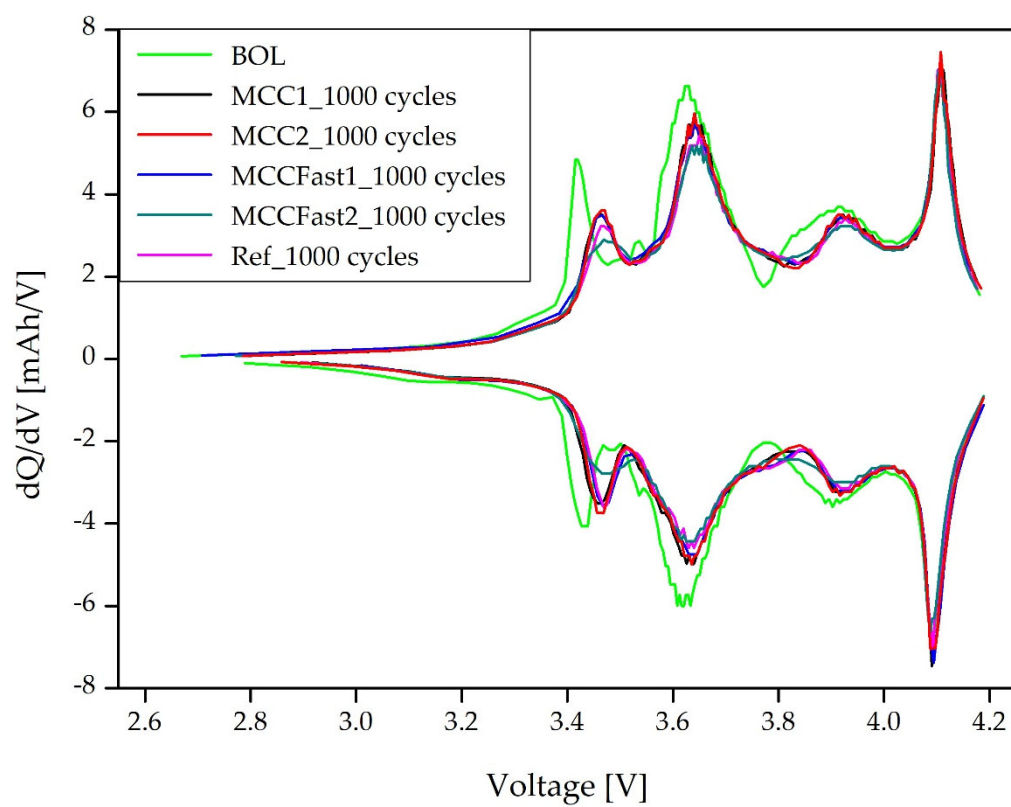


Figure S2 - Incremental capacity analysis comparison

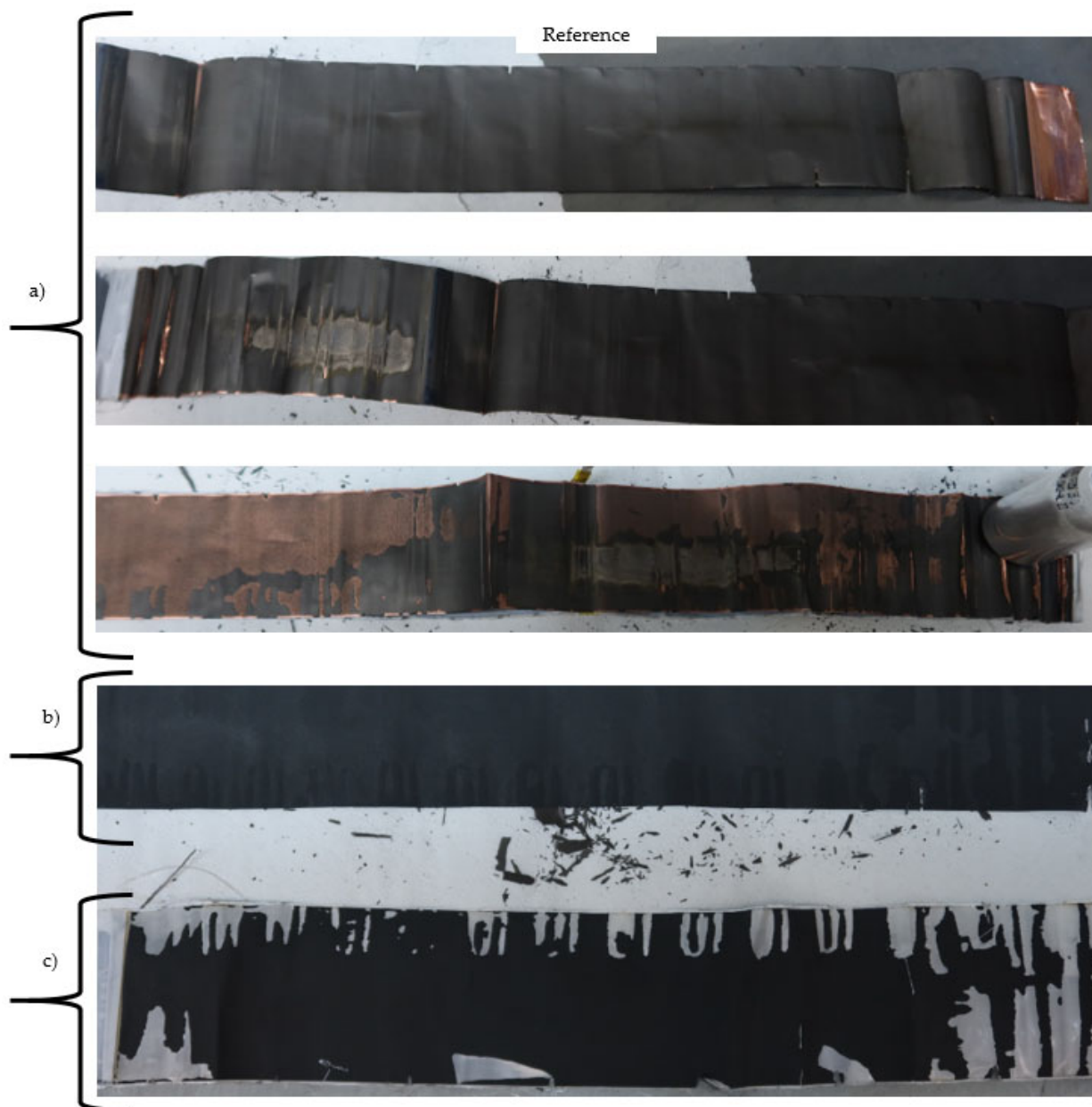


Figure S3 - Reference DCFC profiles Post-mortem visual inspection for a) anode; b) cathode; c) separator

MCC1

a)

b)

Figure S4 - MCC1 DCFC profiles Post-mortem visual inspection for a) anode; b) cathode; c) separator

MCC2

a)



b)



c)



Figure S5 - MCC2 DCFC profile Post-mortem visual inspection for a) anode; b) cathode; c) separator

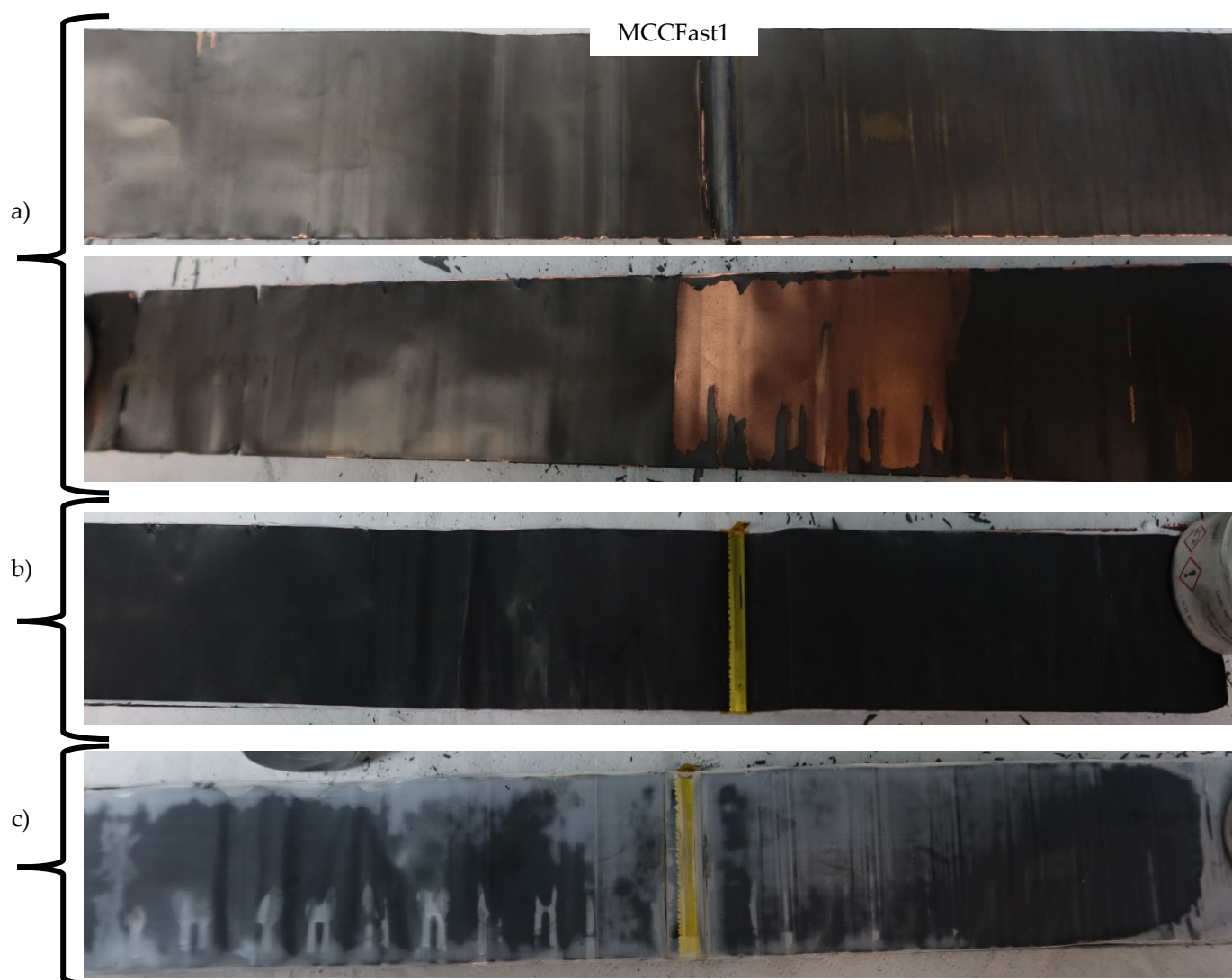


Figure S6 - MCCFast1 DCFC profile Post-mortem visual inspection for a) anode; b) cathode; c) separator

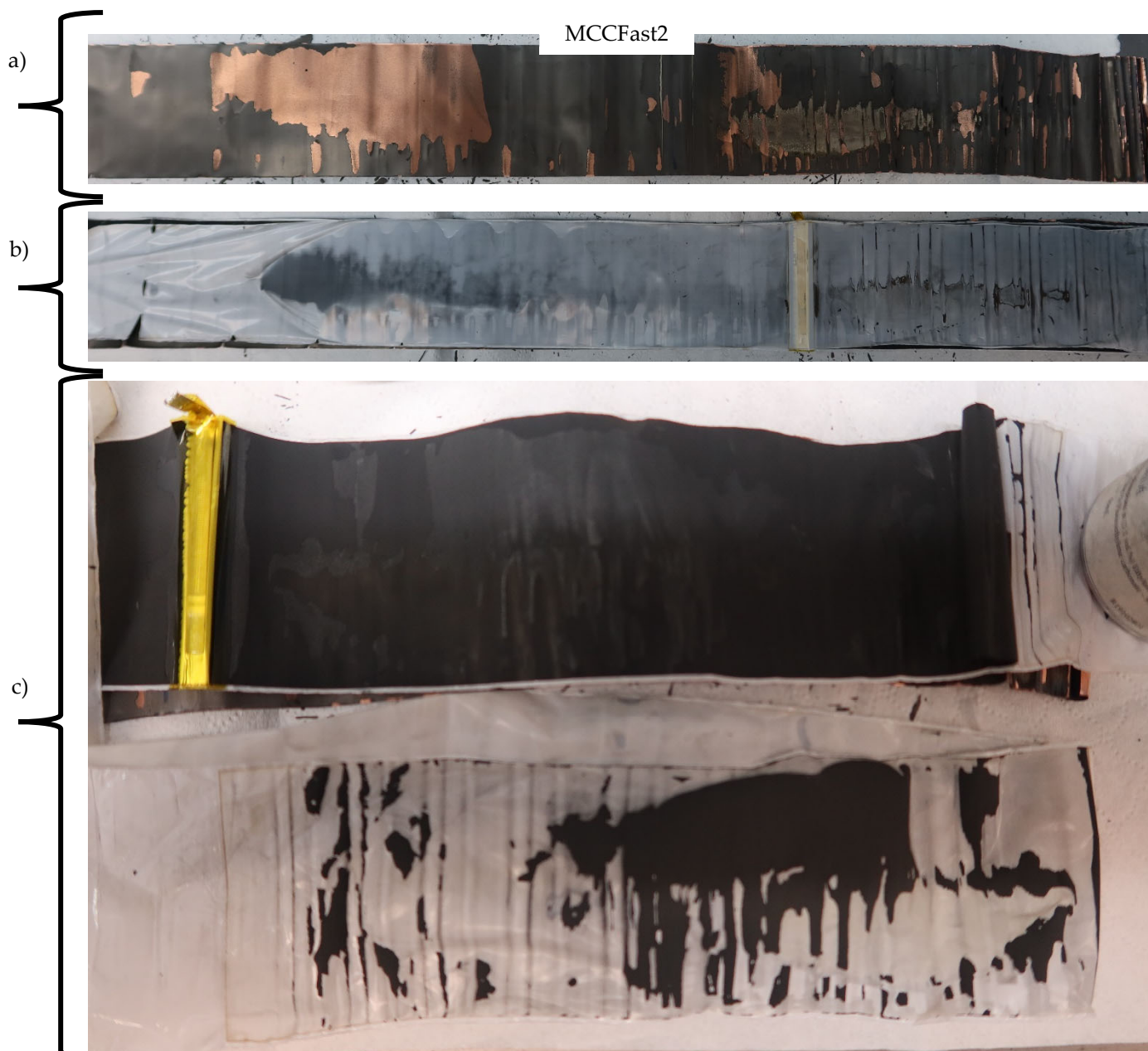


Figure S7 - MCCFast2 DCFC profile Post-mortem visual inspection for a) anode; b) cathode; c) cathode and separator

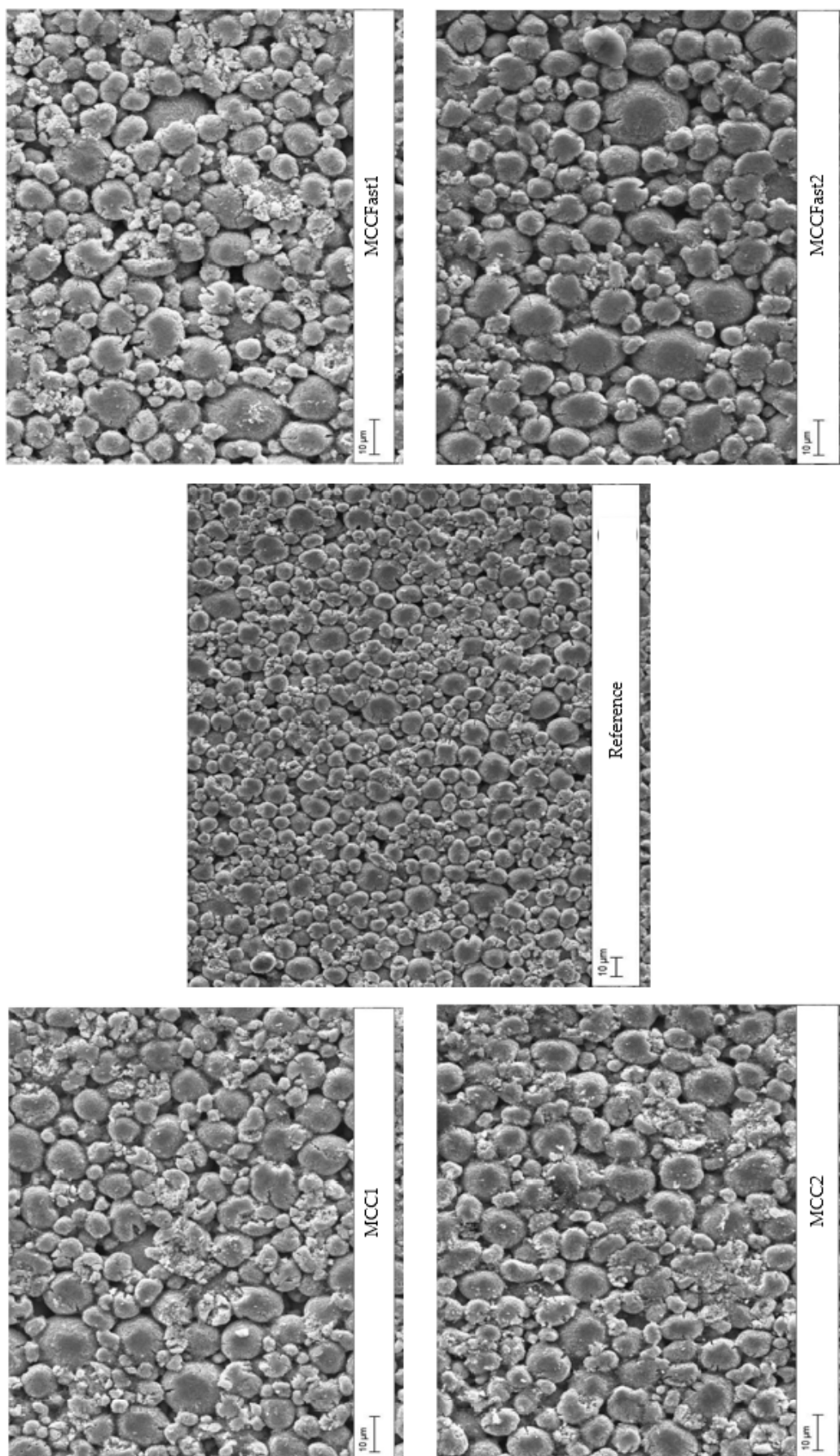


Figure S8 - SEM images for NMC811 for the five DCFC profiles

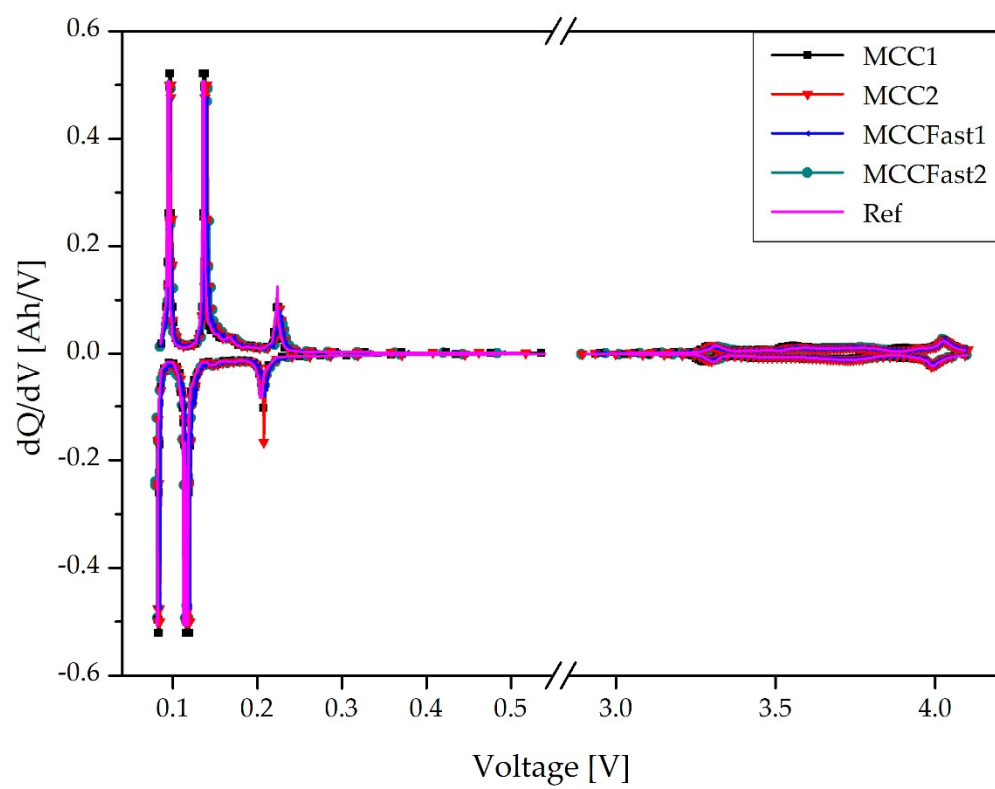


Figure S9 - Three electrode measurement for all the implemented DCFC profiles

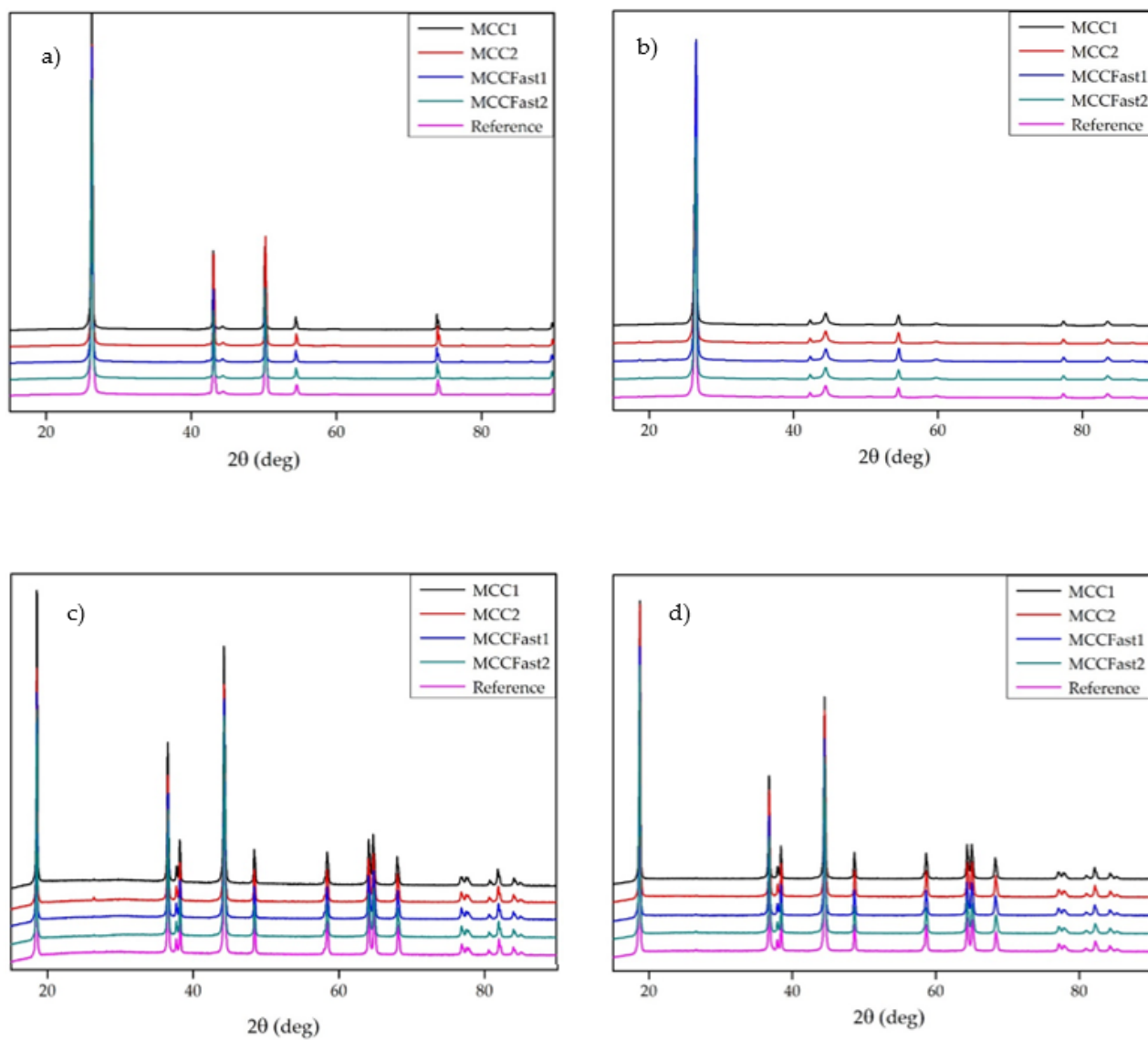


Figure S10 - XRD pattern of a) Si-C calendered; b) Si-C powders; c) NMC811 calendered; d) NMC811 powders

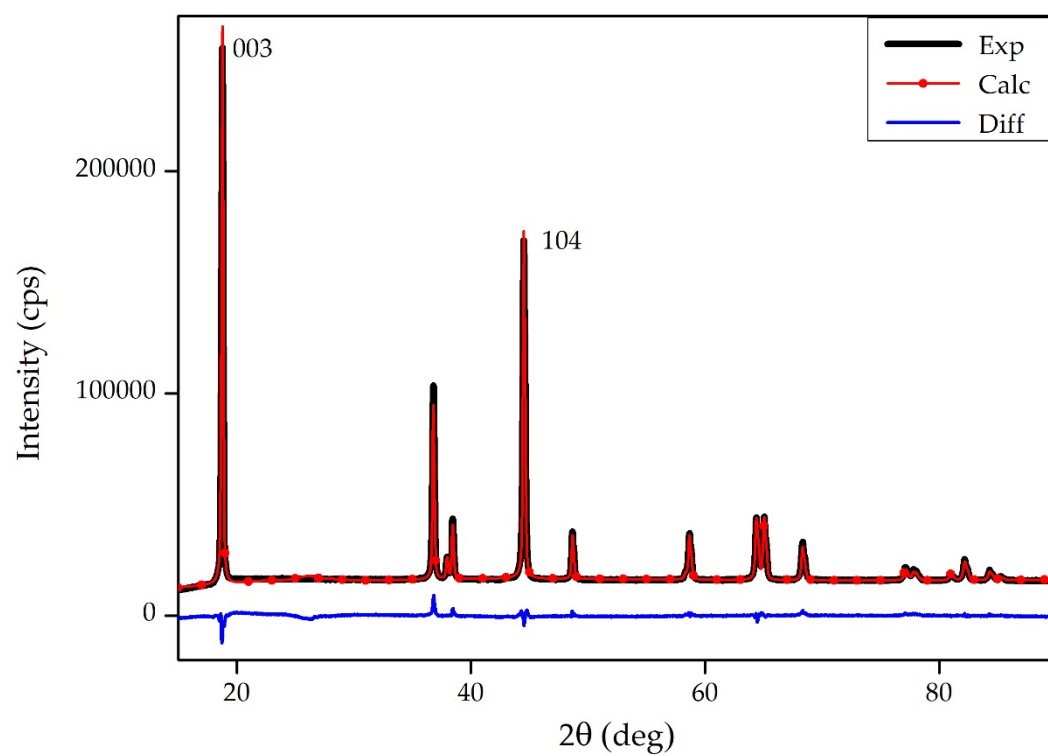


Figure S11 - XRD for NMC811 pattern with Rietveld refinement

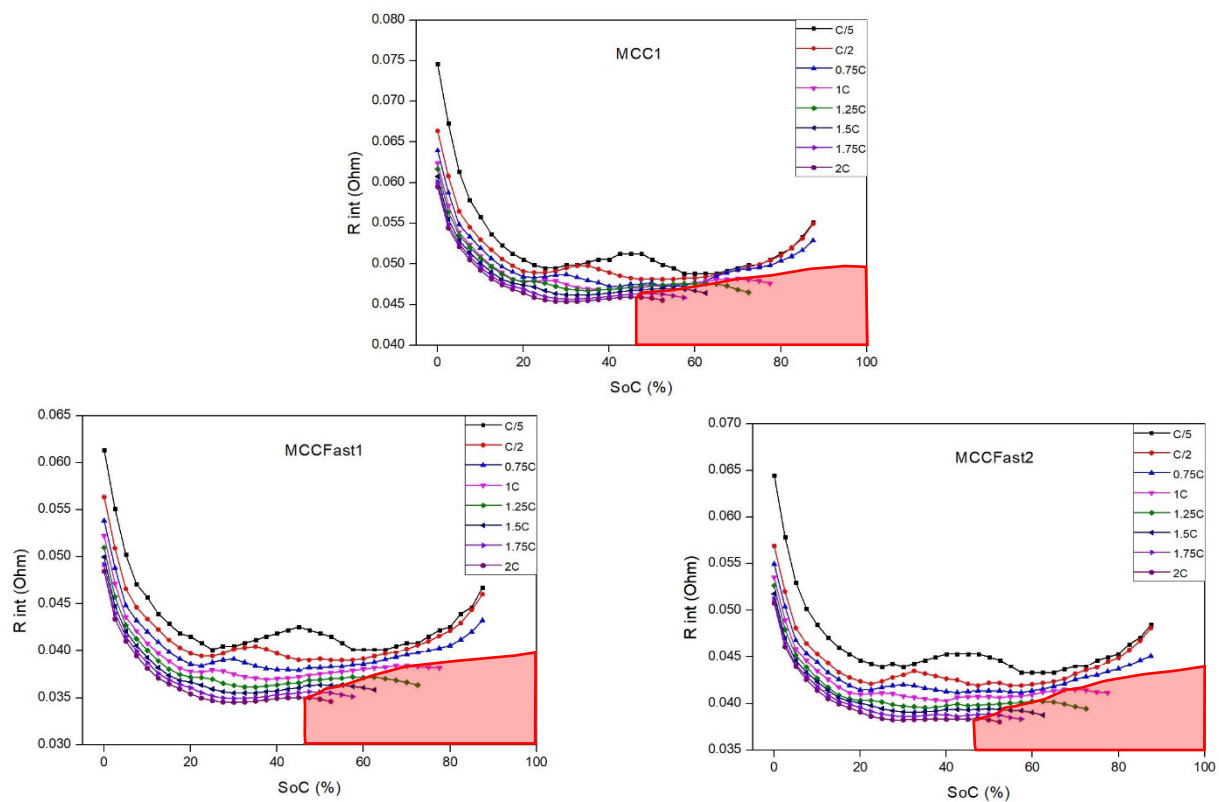


Figure S12 - Internal Resistance Measurements