

# Aging of a lithium-metal/LFP cell: predictive model and experimental validation

Davide Dessantis <sup>1</sup>, Piera Di Prima <sup>1</sup>, Daniele Versaci <sup>2</sup>, Julia Amici <sup>2,\*</sup>, Carlotta Francia <sup>2</sup>, Silvia Bodoardo <sup>2</sup>, Massimo Santarelli <sup>1,\*</sup>

<sup>1</sup> Department of Energy, Polytechnic of Turin, 10129 Turin, Italy

<sup>2</sup> Department of Applied Science and Technology, Polytechnic of Turin, 10129 Turin, Italy

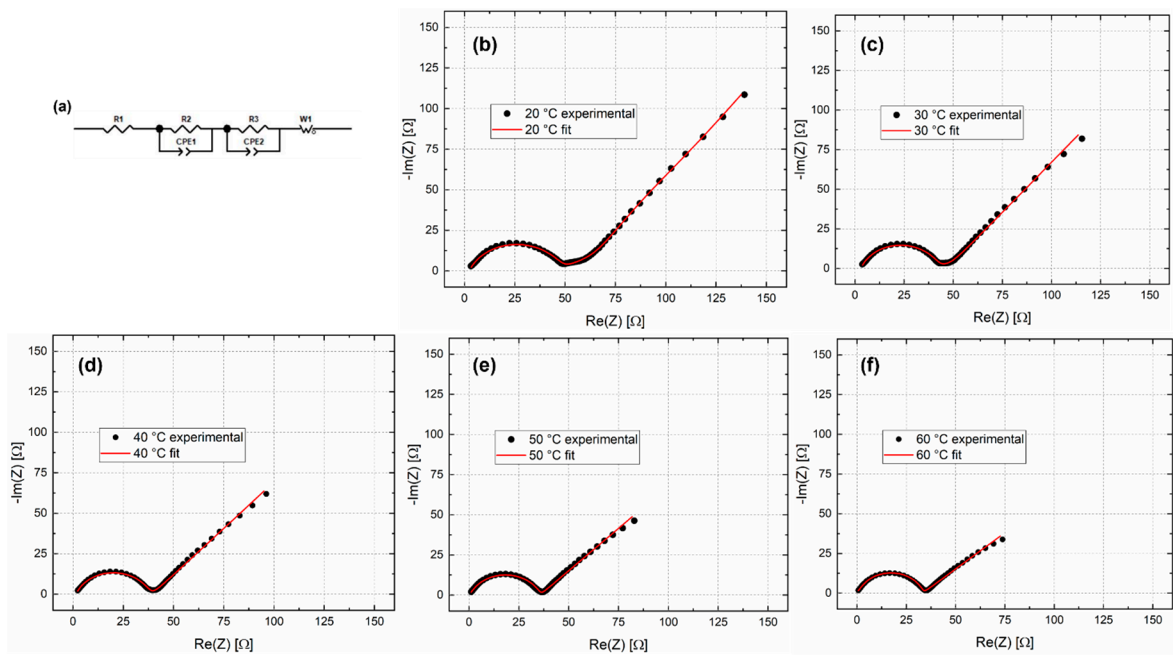
\* Correspondence: julia.amici@polito.it (J.A.); massimo.santarelli@polito.it (M.S.)

**Table S1.** Error values between model and experimental data.

Cycle step	Error Values for Model-Experiment			
	C/10	C/5	C/2	1C
Charge Capacity 1 <sup>st</sup>	0.34%	0.21%	0.20%	0.22%
Discharge Capacity 1 <sup>st</sup>	0.08%	0.01%	0.38%	2.43%
Charge Capacity 2 <sup>nd</sup>	0.15%	0%	0%	1.62%
Discharge Capacity 2 <sup>nd</sup>	-0.73%	0.01%	0%	1.73%
Charge Capacity 3 <sup>rd</sup>	-0.72%	0.01%	0%	1.36%
Discharge Capacity 3 <sup>rd</sup>	-0.75%	0%	0%	1.15%

**Table S2.** Comparison of discharge capacity and capacity loss values obtained experimentally and from the model.

	Experimental		Simulation	
	C/2	1C	C/2	1C
Discharge Capacity 1 <sup>st</sup> [mAh g <sup>-1</sup> ]	127.87	119.01	127.83	118.09
Discharge Capacity 50 <sup>th</sup> [mAh g <sup>-1</sup> ]	124.21	114.21	124.77	113.46
Capacity loss	2.86%	4.03%	2.39%	3.92%



**Figure S1.** Equivalent circuit model (a) used to fit EIS at 20 °C (b), 30 °C (c), 40 °C (d), 50 °C (e) and 60 °C (f).