

Supporting Information

Rate capability performance of high areal capacity water-based NMC811 electrodes: the role of binders and current collectors

Yuri Surace^{a*}, Marcus Jahn^a, Damian Cupid^a

*^aBattery Technologies, Center for Transport Technologies, AIT Austrian Institute of
Technology GmbH, Giefinggasse 4, 1210 Vienna, Austria*

* To whom correspondence should be addressed
(e-mail: yuri.surace@ait.ac.at Tel +43 50550-6243).

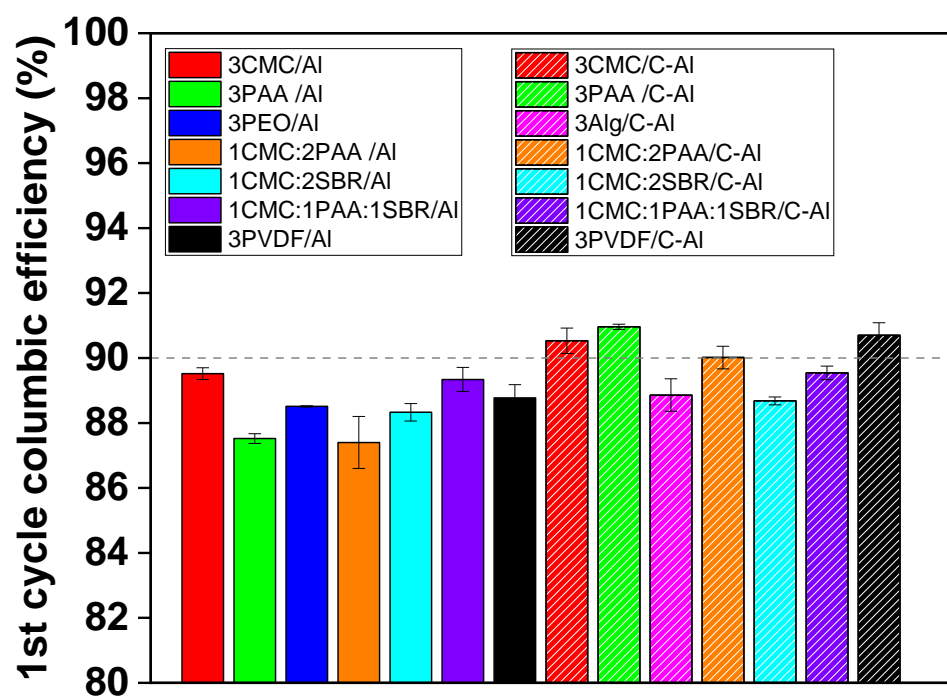
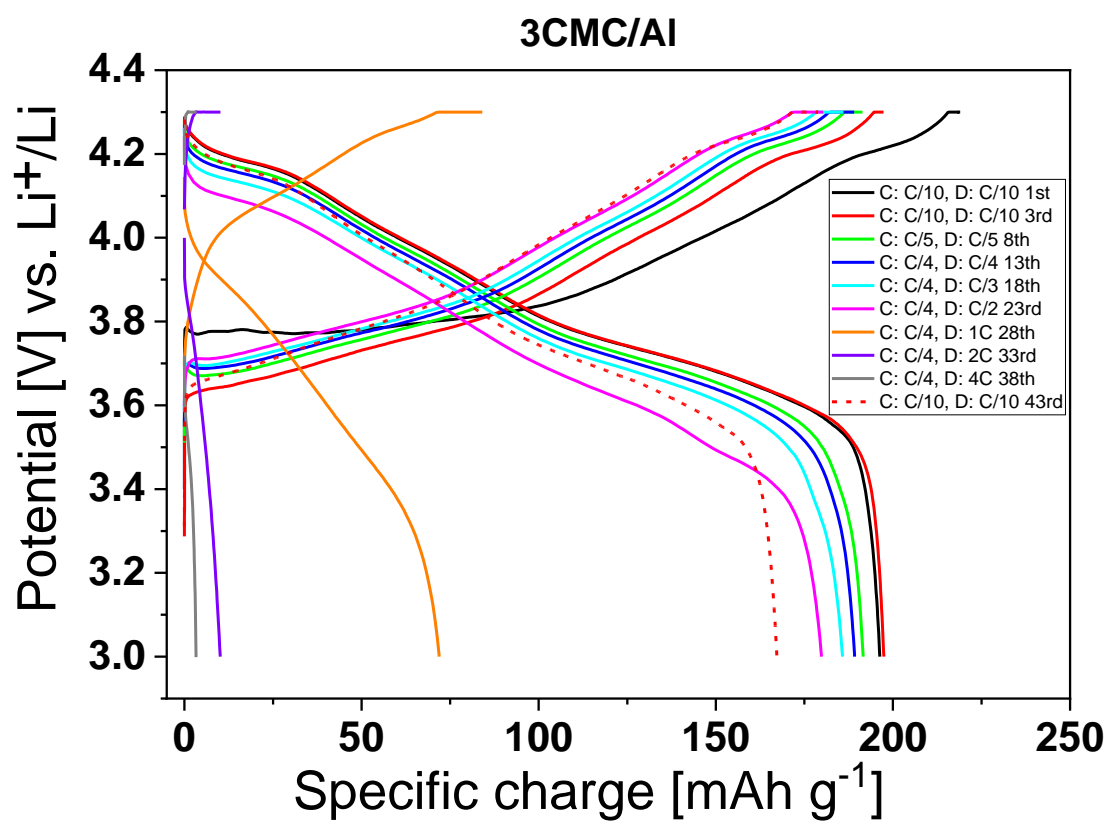
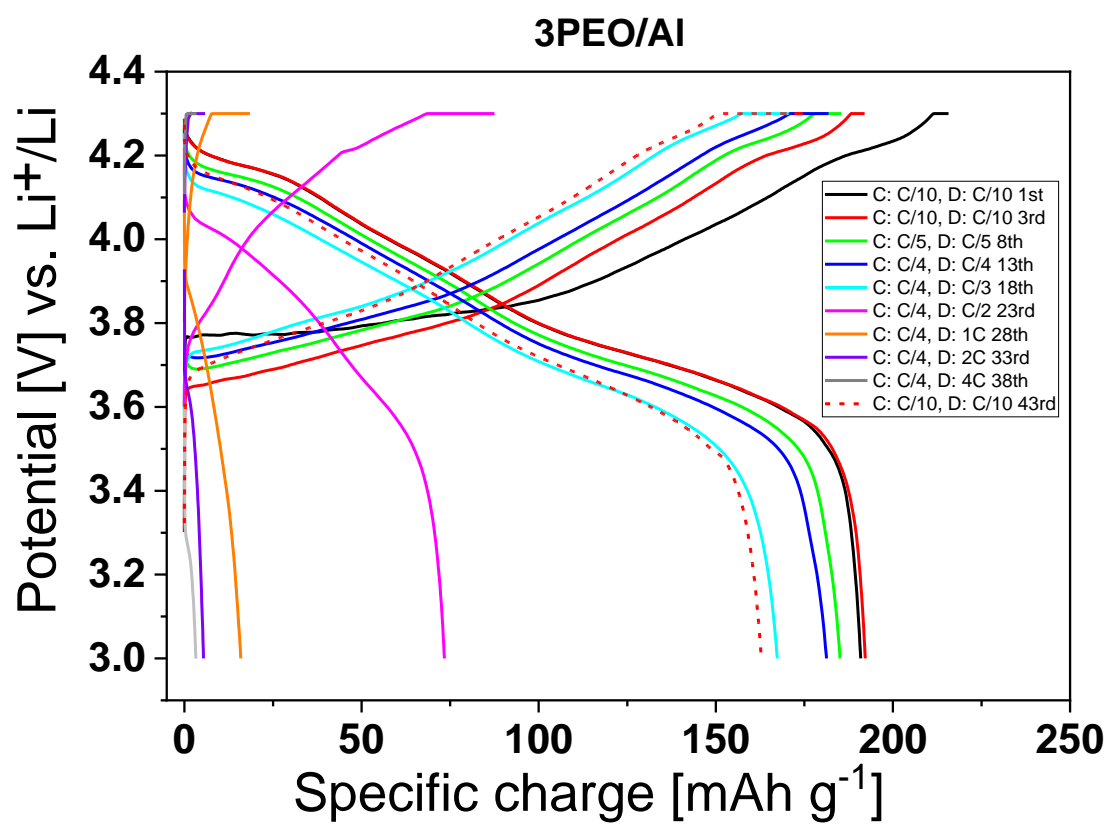
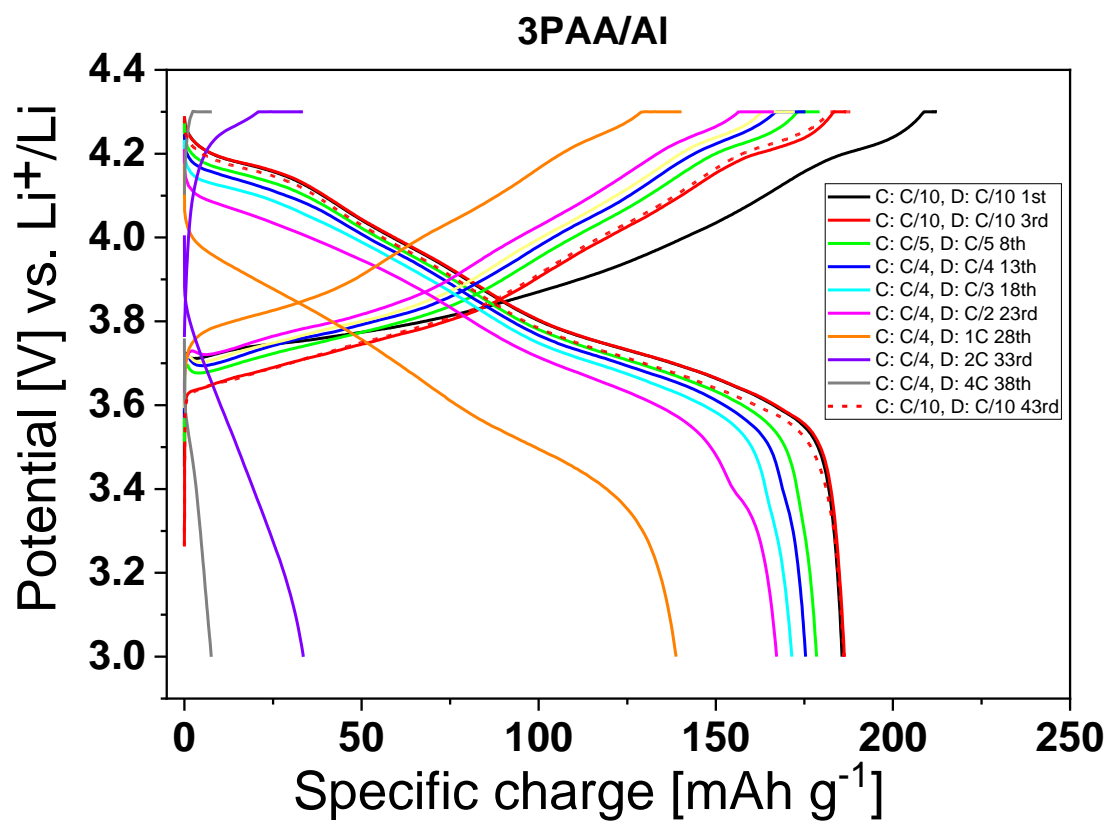


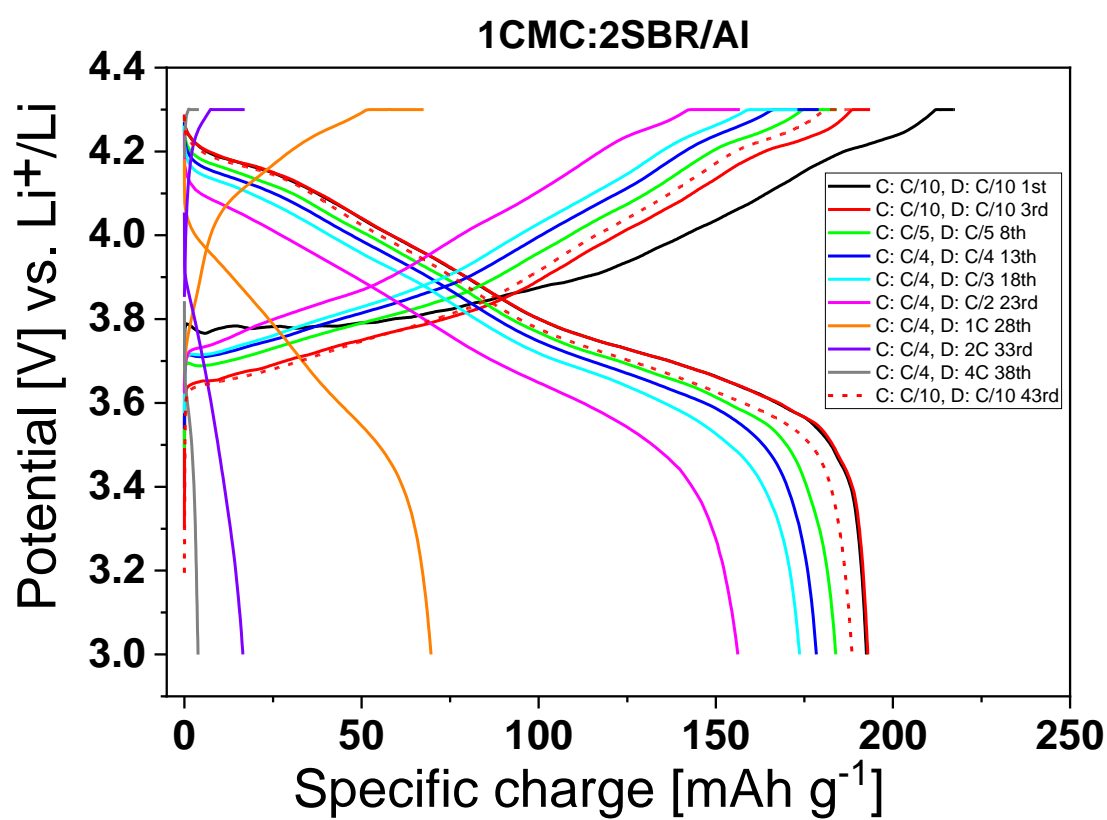
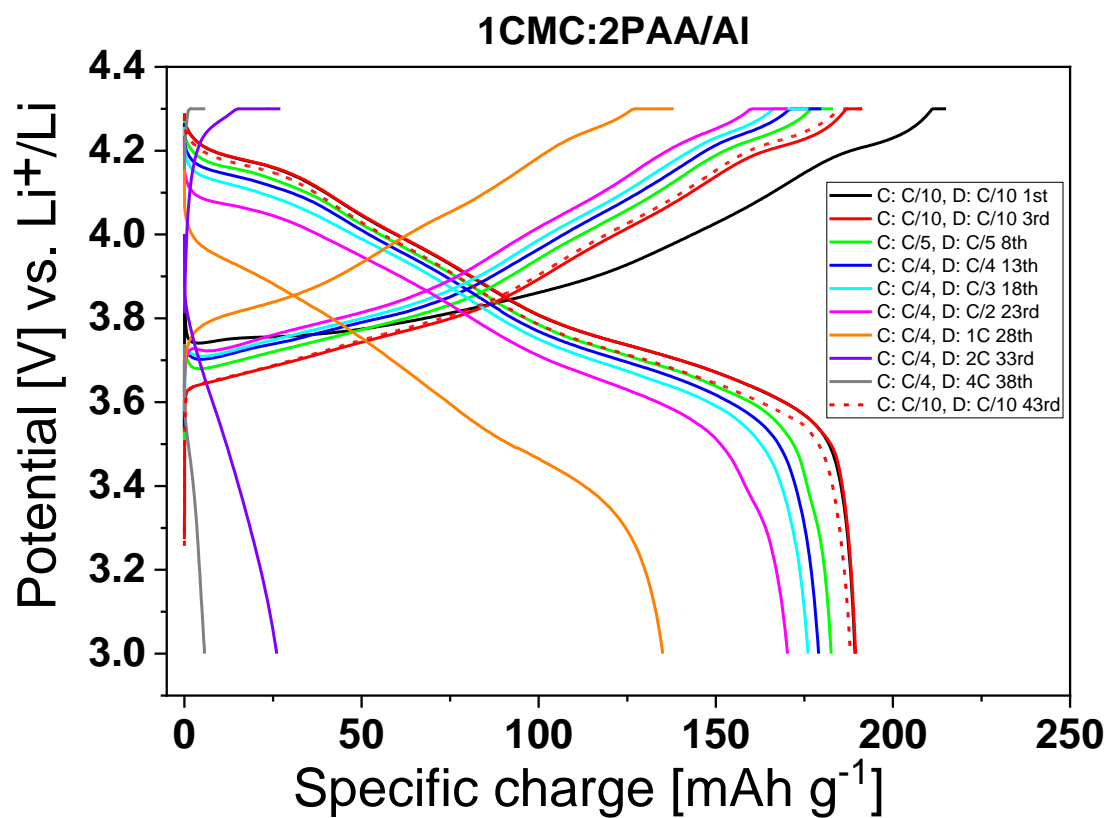
Fig.S1: 1st cycle columbic efficiency of the investigated electrode.

Table S1: 1st cycle columbic efficiency of the investigated electrodes

Electrode	1 st cycle columbic efficiency (%)	St.Dev.	Electrode	1 st cycle columbic efficiency (%)	St.Dev.
3CMC/Al	89.5	0.2	3CMC/C-Al	90.5	0.4
3PAA/Al	87.5	0.2	3PAA/C-Al	91.0	0.1
3PEO/Al	88.5	0.1	3Alg/C-Al	88.9	0.5
1CMC:2PAA/Al	87.4	0.4	1CMC:2PAA/C-Al	90.0	0.3
1CMC:2SBR/Al	88.3	0.3	1CMC:2SBR/C-Al	88.7	0.1
1CMC:1PAA:1SBR/Al	89.3	0.4	1CMC:1PAA:1SBR/C-Al	89.5	0.2
3PVDF/Al	88.8	0.4	3PVDF/C-Al	90.7	0.4







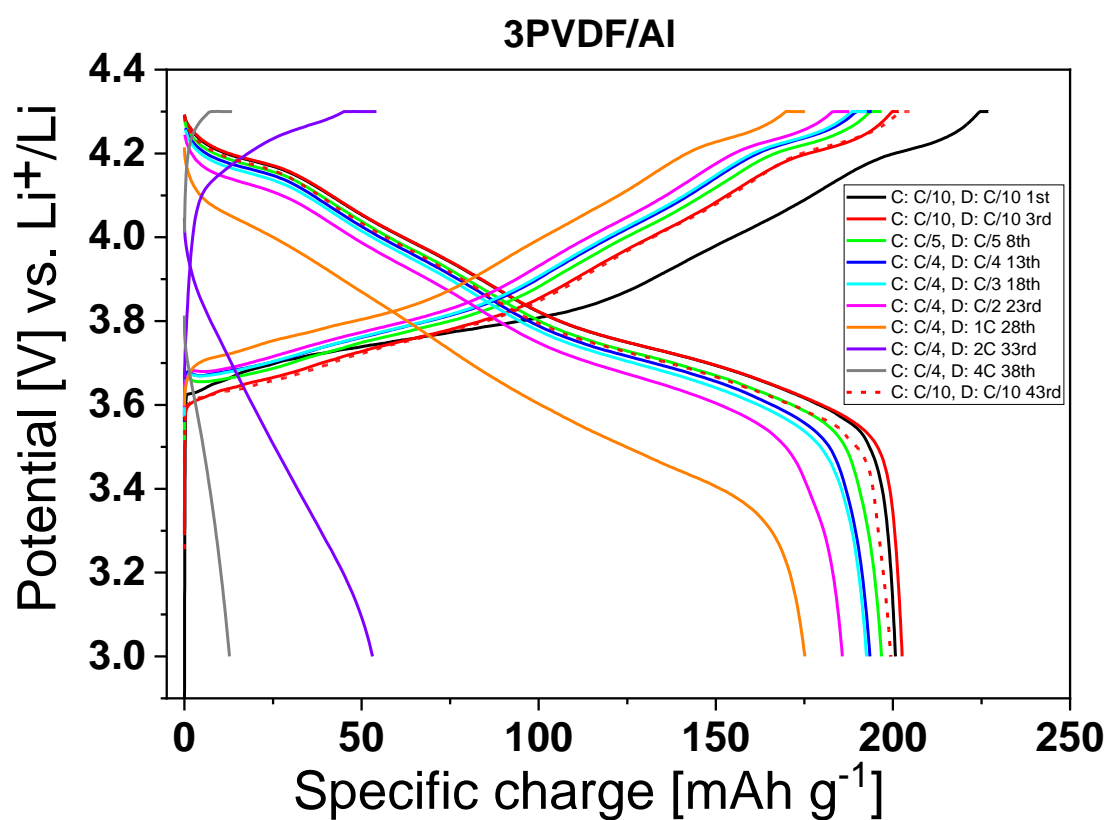
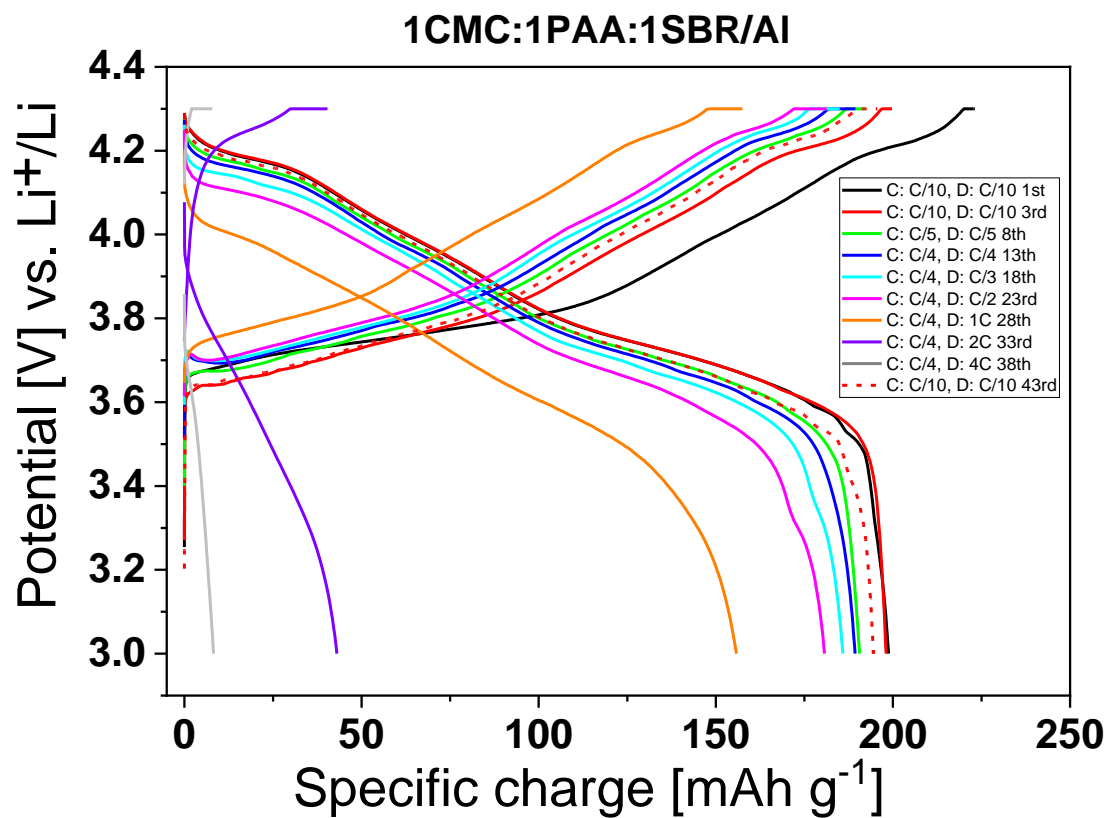
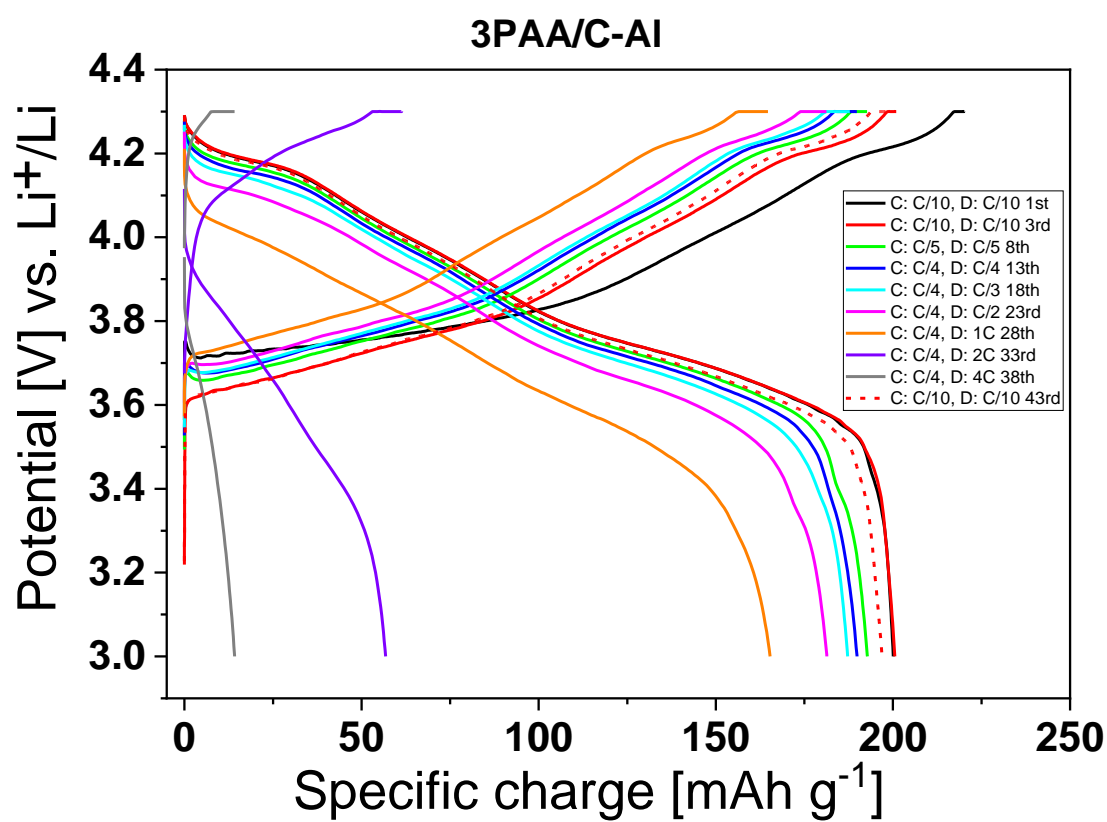
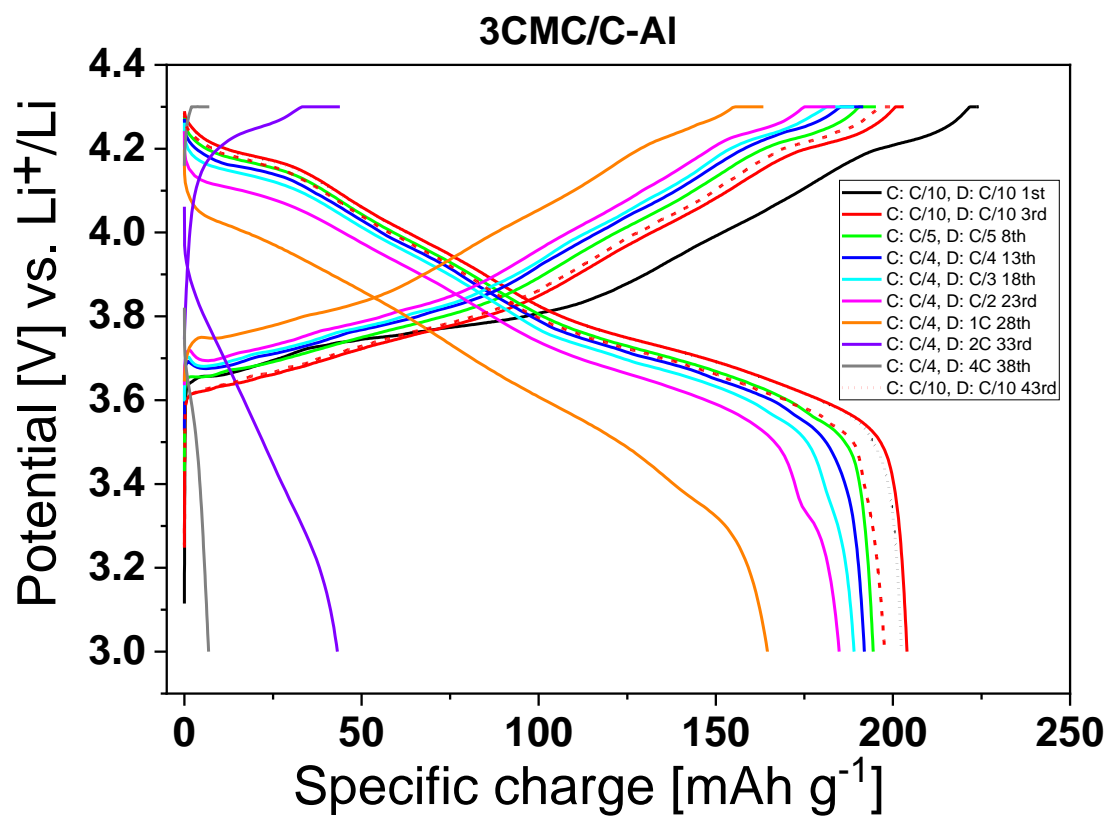
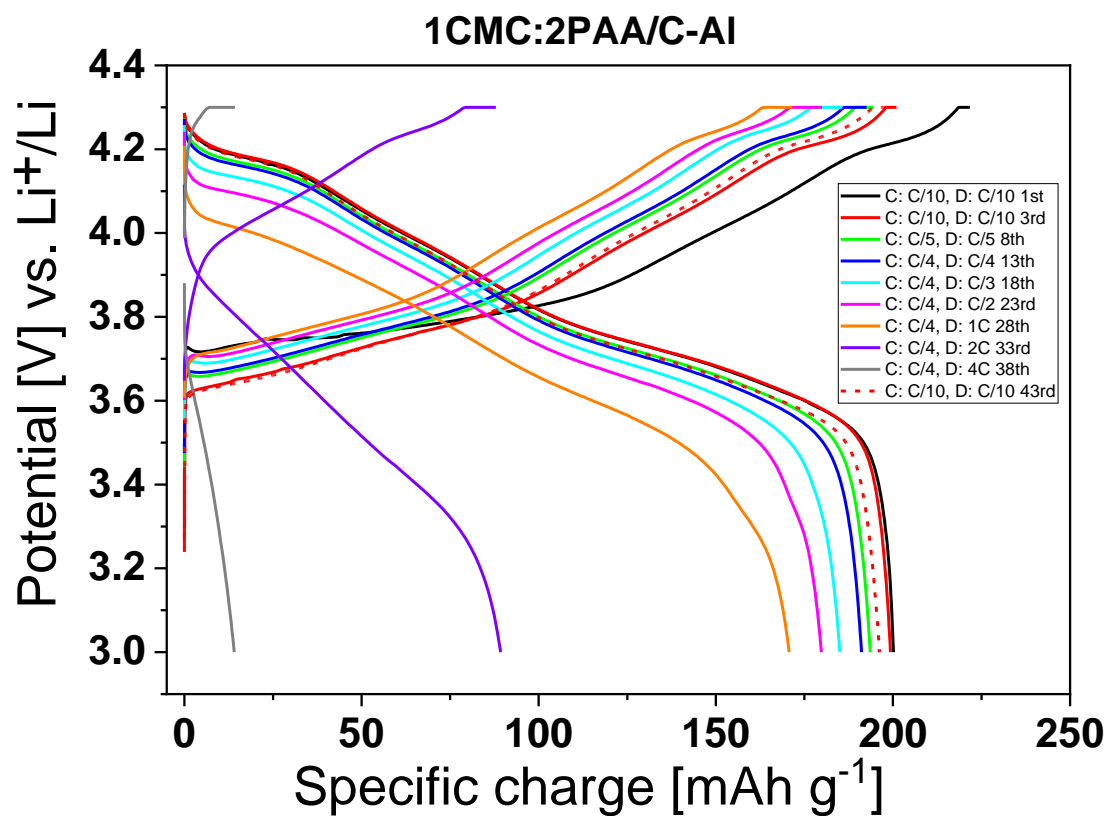
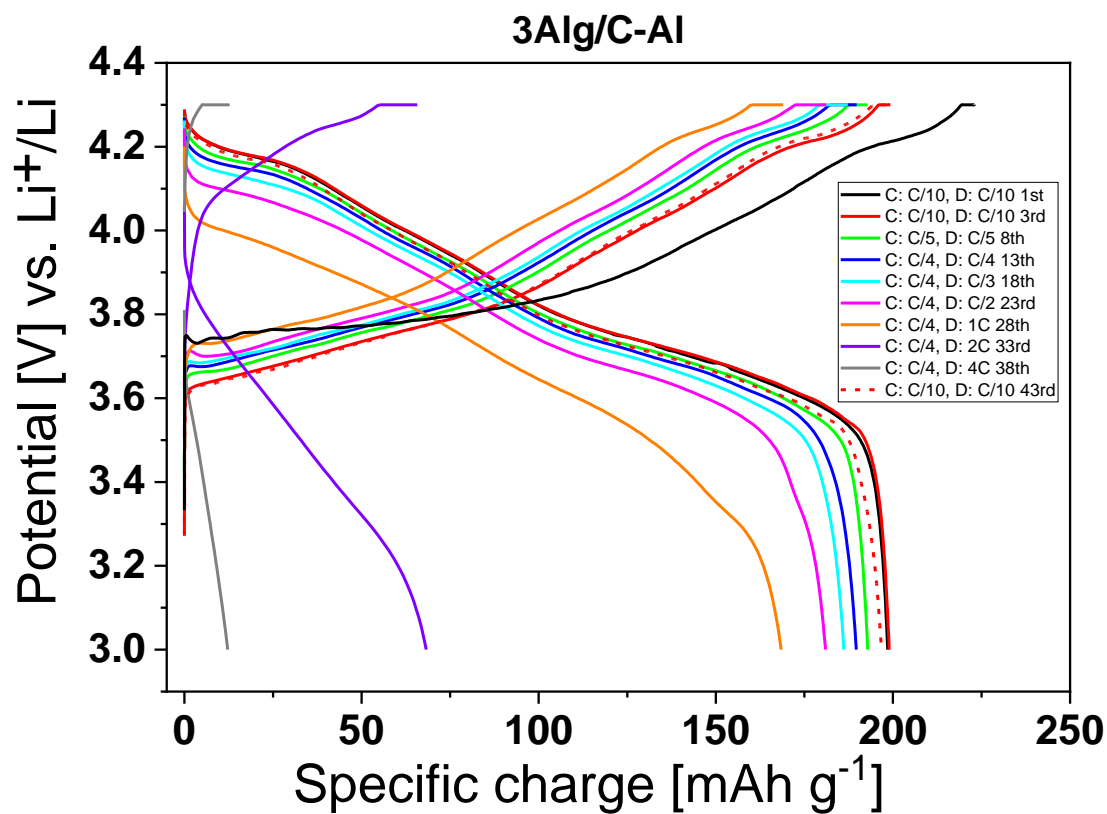
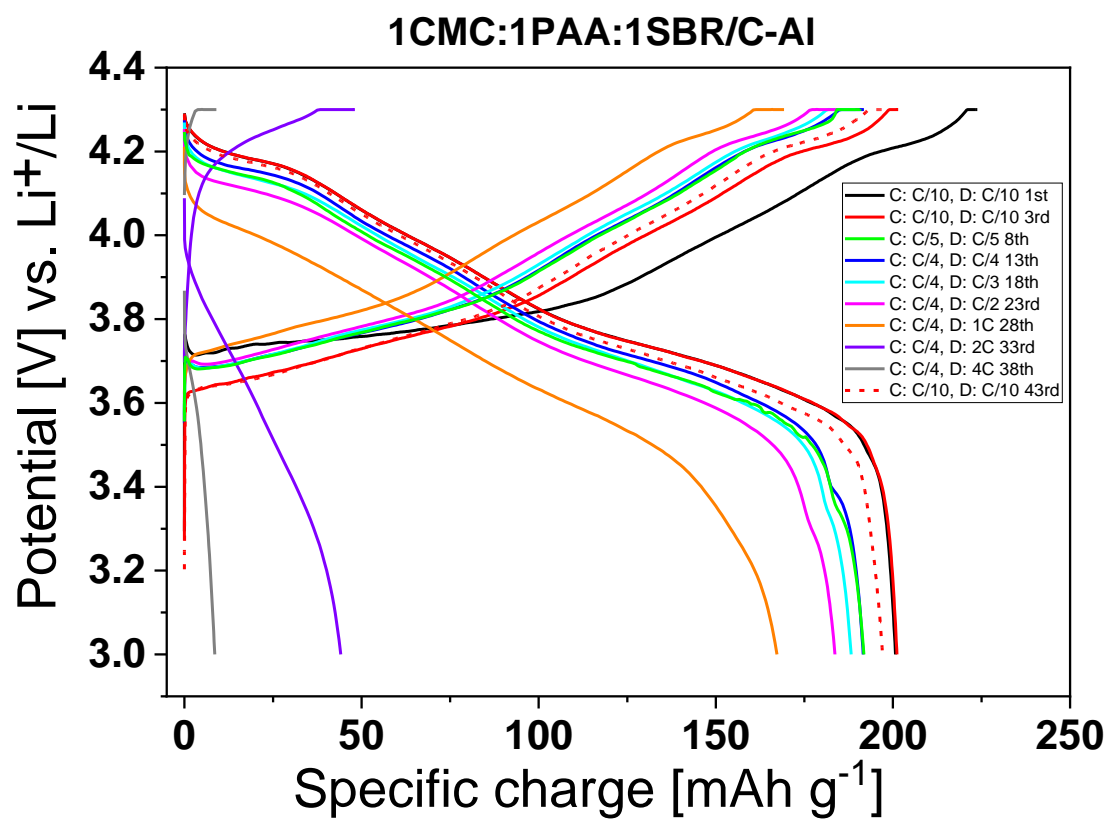
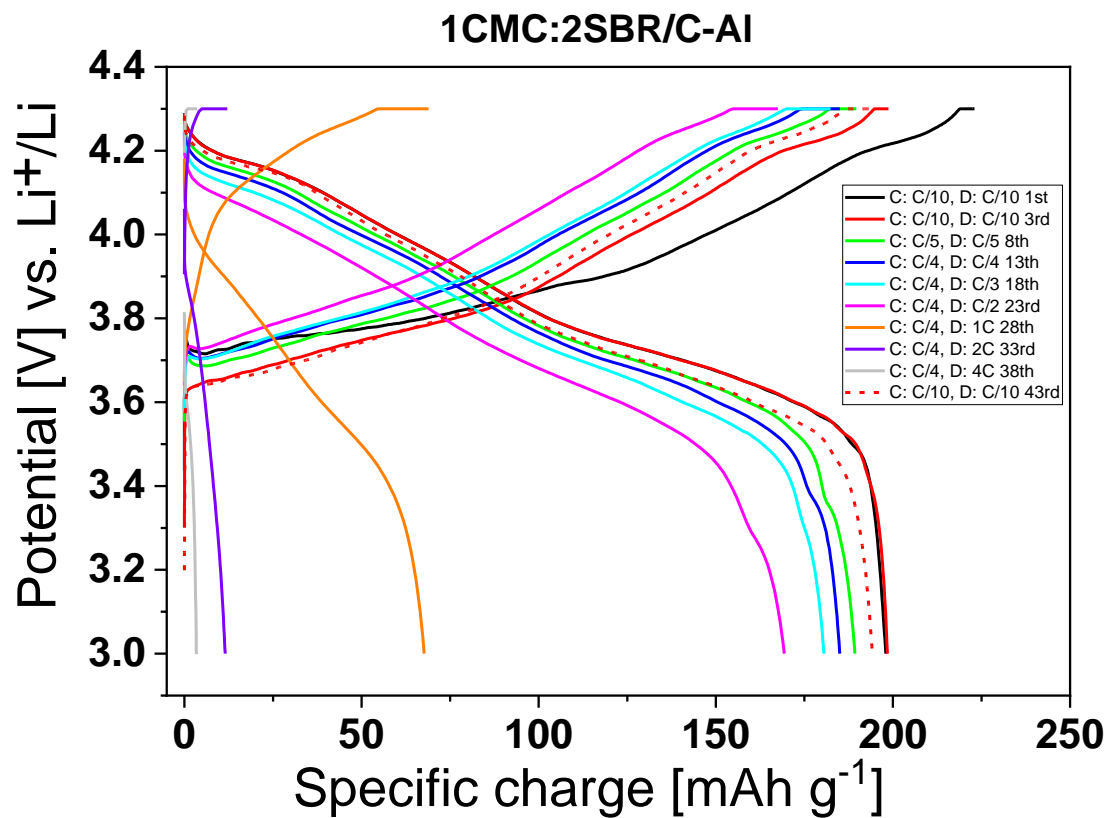


Fig.S2: Potential profile of 3CMC/Al, 3PAA/Al, 3PEO/Al, 1CMC:2PAA/Al, 1CMC:2SBR/Al, CMC:1PAA:1SBR/Al and 3PVDF/Al electrodes.







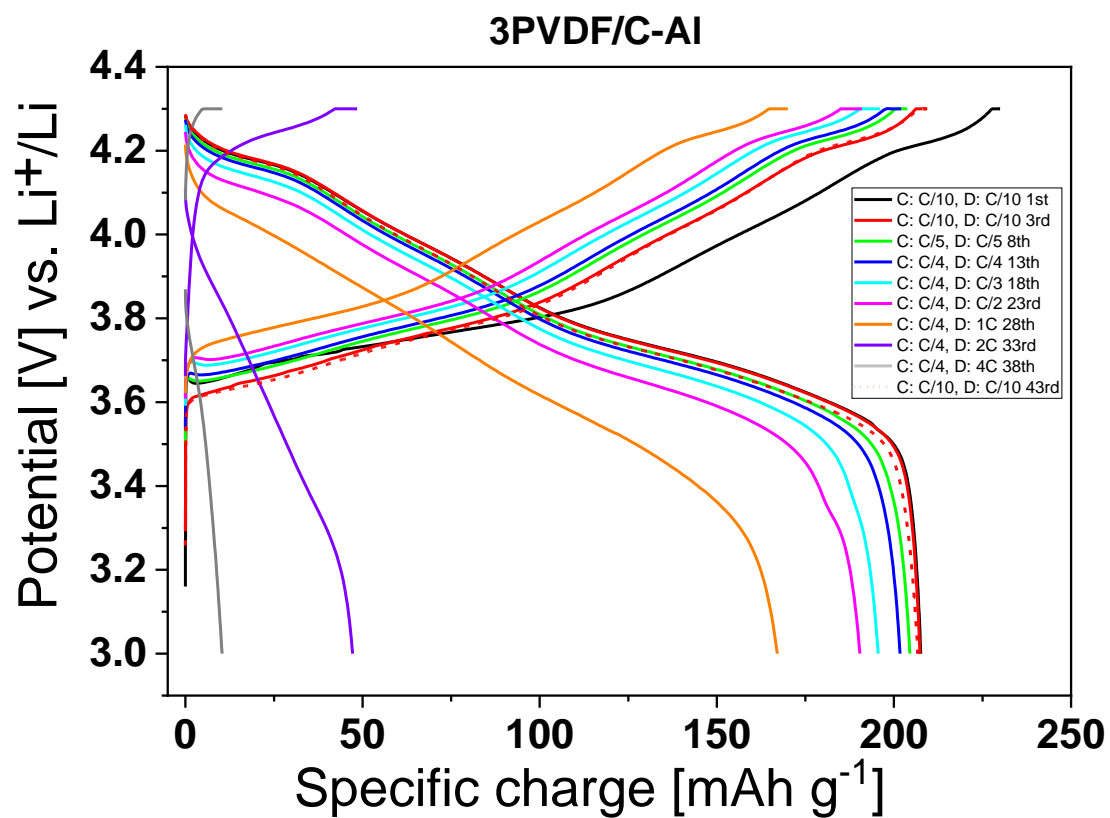


Fig.S3: Potential profile of 3CMC/C-Al, 3PAA/C-Al, 3Alg/C-Al, 1CMC:2PAA/C-Al, 1CMC:2SBR/C-Al, 1CMC:1PAA:1SBR/C-Al, and 3PVDF/C-Al

Table S2: Absolute capacity and relative capacity of the investigated electrodes.

	Cycle nr.	3	8	13	18	23	28	33	38	43
	Rate	C/10	C/5	C/4	C/3	C/2	1C	2C	4C	C/10
3CMC/Al	Abs.capacity (mAh g ⁻¹)*	196.6	190.1	187.1	183.1	176.8	69.8	10.0	3.1	170.3
	Rel.capacity (%)	100.0	96.7	95.2	93.1	89.9	35.5	5.1	1.6	86.6
3PAA/Al	Abs.capacity (mAh g ⁻¹)	187.0	179.0	175.9	172.2	167.2	132.0	29.5	7.2	186.6
	Rel.capacity (%)	100.0	95.7	94.1	92.1	89.5	70.6	15.8	3.8	99.8
3PEO/Al	Abs.capacity (mAh g ⁻¹)	192.4	185.2	181.3	167.8	77.5	16.4	5.5	3.2	166.7
	Rel.capacity (%)	100.0	96.3	94.2	87.2	40.3	8.5	2.8	1.7	86.7
1CMC:2PAA/Al	Abs.capacity (mAh g ⁻¹)	188.3	180.8	177.6	174.5	169.3	140.0	31.1	6.3	187.5
	Rel.capacity (%)	100.0	96.0	94.3	92.7	89.9	74.4	16.5	3.3	99.5
1CMC:2SBR/Al	Abs.capacity (mAh g ⁻¹)	193.8	184.6	180.0	175.0	158.0	68.5	15.9	3.8	188.9
	Rel.capacity (%)	100.0	95.3	92.9	90.3	81.5	35.3	8.2	1.9	97.5
1CMC:1SBR1PAA/Al	Abs.capacity (mAh g ⁻¹)	199.3	191.7	188.5	186.1	180.0	152.3	37.5	7.2	194.7
	Rel.capacity (%)	100.0	96.2	94.6	93.4	90.3	76.4	18.8	3.6	97.7
3PVDF/Al	Abs.capacity (mAh g ⁻¹)	202.0	195.9	192.0	189.9	183.2	171.6	52.8	13.0	198.9
	Rel.capacity (%)	100.0	97.0	95.0	94.0	90.7	84.9	26.1	6.4	98.4
3CMC/C-Al	Abs.capacity (mAh g ⁻¹)	201.9	195.4	191.7	188.6	183.7	159.6	37.8	6.5	198.2
	Rel.capacity (%)	100.0	96.8	95.0	93.4	91.0	79.0	18.7	3.2	98.1
3PAA/C-Al	Abs.capacity (mAh g ⁻¹)	201.1	192.9	190.1	187.6	181.5	164.5	53.2	12.5	196.8
	Rel.capacity (%)	100.0	95.9	94.6	93.3	90.2	81.8	26.4	6.2	97.9
3Al/C-Al	Abs.capacity (mAh g ⁻¹)	199.3	192.8	190.0	186.6	181.6	168.8	70.2	13.8	197.1
	Rel.capacity (%)	100.0	96.7	95.3	93.6	91.1	84.7	35.2	6.9	98.9
1CMC:2PAA/C-Al	Abs.capacity (mAh g ⁻¹)	199.3	192.8	190.4	185.7	181.2	171.9	88.5	14.4	196.5
	Rel.capacity (%)	100.0	96.8	95.5	93.2	90.9	86.2	44.4	7.2	98.6
1CMC:2SBR/C-Al	Abs.capacity (mAh g ⁻¹)	197.2	189.5	184.8	182.3	169.7	73.7	12.3	3.6	192.8
	Rel.capacity (%)	100.0	96.1	93.7	92.5	86.1	37.4	6.3	1.8	97.8
1CMC:1SBR1PAA/C-Al	Abs.capacity (mAh g ⁻¹)	200.0	193.8	190.9	186.6	183.2	162.9	44.0	8.1	196.4
	Rel.capacity (%)	100.0	96.9	95.5	93.3	91.6	81.5	22.0	4.0	98.2
3PVDF/C-Al	Abs.capacity (mAh g ⁻¹)	208.5	205.4	203.0	198.4	193.1	175.9	52.4	13.4	208.4
	Rel.capacity (%)	100.0	98.5	97.4	95.2	92.6	84.3	25.1	6.4	100.0

*the average value of the 3rd cycle of each rate is considered