

Supplementary Materials

Thick electrodes for high-energy rechargeable lithium batteries: degradation mechanisms, architectural strategies, and capacity-utilization metrics

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Supplementary Table 1. Source data for the capacity-utilization comparison in Figure 11, including Q_{design} , $Q_{\text{achievable}}$, operating current density, and relevant testing conditions

Q_{design} (mAh cm ⁻²)	$Q_{\text{achievable}}$ (mAh cm ⁻²)	Current density (mA cm ⁻²)	Capacity utilization (%)	System / condition	Q_{design} basis	Reference
9.60	7.54	9.60	78.54	LIB LFP half-cell; 1C	60 mg cm ⁻² x 160 mAh g ⁻¹	[98]
2.82	2.41	5.00	85.46	LIB LCO half-cell; 5 mA cm ⁻²	20 mg cm ⁻² x 141.2 mAh g ⁻¹	[101]

6.20	3.08	6.22	49.68	LIB NMC83 half-cell; 1C	Reported theoretical areal capacity (6.2 mAh cm ⁻²)	[102]
22.60	18.63	2.25	82.43	LIB NCM811 half-cell	Reported theoretical areal capacity (22.6 mAh cm ⁻²)	[122]
18.70	17.60	1.70	94.12	Li-metal pouch; 0.1C	100 mg cm ⁻² x 187 mAh g ⁻¹	[123]
6.30	4.44	6.00	70.48	LIB LFP half- cell; 1C	Reported theoretical areal capacity (6.3 mAh cm ⁻²)	[124]
11.25	10.40	2.25	92.44	ASSB LCO; 60 °C; 50 MPa	Reported theoretical areal capacity (11.25 mAh cm ⁻²)	[111]
10.00	8.80	10.00	88.00	LIB NCM half-cell; 1C	Reported theoretical areal capacity (10 mAh cm ⁻²)	[125]

22.90	20.60	1.15	89.96	LIB LFP half-cell; C/20	Reported theoretical areal capacity (22.9 mAh cm ⁻²)	[38]
5.00	5.00	1.00	100.00	ASSB NMC83; 80 °C; 2 MPa	Reference CAM capacity: 210 mAh g ⁻¹ *	[96]

*For Ref. [96], the CAM-specific capacity reaches the reference capacity of 210 mAh g⁻¹ reported for the same NMC83 material in a liquid-electrolyte cell; therefore, Qachievable is equivalent to Qdesign within the reported precision.