Table S1: Comparison of practical battery performance of anodes based on a few parameters

	Initial Coulombic Efficiency	Coulombic Efficiency (%)	Long Cycle Stability	Rate performance
Carbon -based anodes				**1C= 372 mA/g wrt. graphite**
Graphite[1] (multi-layer pouch cells (>1 Ah) and electrode capacity loadings (3 mAhcm^{-2})	88 %	Attained~ 100% after 60 cycles at 4C	58% retention after 100 cycles	1C – 96% retention after 200 cycles 4C- 67% after 100 cycles 6C- 58% after 100 cycles
Hard Carbon[1] (multi-layer pouch cells (>1 Ah) and electrode capacity loadings (3 mAhcm^{-2})	76 %	Attained ~100% within first 10 cycles at 3.72 A/g	93% after 100 cycles	0.37 A/g – 96% after 200 cycles 1.48 A/g- 96% after 100 cycles 2.23 A/g- 93% after 100 cycles
Heteroatom doped hard carbon[2] (coin cell CR2025 type)	68 %	Attained ~100% from 3rd cycle at 3.72 A/g	81% after 2300 cycles at 3.72 A/g	Discharge capacities of ~73, ~52, ~46 and ~32 mAh/g at 3.72, 7.44, 11.16, and 18.60 A/g with 80, 82, 90, and 82%, retention even after 3000 cycles
High-Capacity Anodes				
Micron Silicon	86 %	Attained ~100% within first 10 cycles	43 % after 8th cycle at 50 mA/g	242, 82, 38, 14, 4 and 1 mAh/g at 100, 200, 300, 500, 1000 and 2000 mA/g
Lithium metal[3]	80 %	Attained ~100% within first 15 cycles	60 % after 150th cycle at 2C	151.9, 145.8, 136.3, 112.2, and 93.7 mAh/g at 0.5, 1, 2, 5, 10 C (1C=3860 mA/g)
Organic Anodes[4]	65 %	Attained 99.2% within first 10 cycles	80% after 1100 cycles at 1000 mA/g	850, 740, and 300 mAh/g at 400, 750, and 1000 mA/g

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