

Supplementary Information

Transmogrifying the waste blister packs into defect engineered graphene-like turbostratic carbon: Novel Lithium-ion (Li-ion) battery anode with noteworthy electrochemical characteristics

Raman spectroscopic profile-fitting results of blister derived carbon materials (BCAM's)

The degree of graphitization in the prepared carbonaceous materials was further revealed by Raman spectroscopic characterization and the results are included in Figure 4(e-h) and SI-2 (a-c). To get more insights into the degree of graphitization and level of disorders in the blister packs derived carbon anode materials (BCAM's) deconvolution of the Raman spectroscopic results were done and the outcomes are included in SI-2 (a-c).

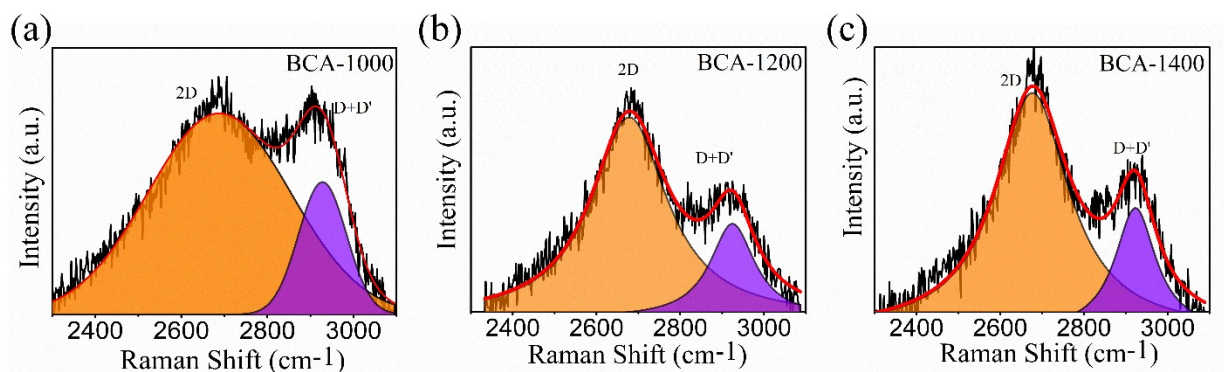


Fig. S1 Raman spectroscopic fitting results of blister derived carbon materials (BCAM's), (a-c) profile fitting curves of 2D and D+D' bands

From the figure, it is quite evident that BCAM's carbons showed four distinct Raman speaks, respectively. These results noted that when the activation temperature increased, the size of the graphitic crystal planes and disordered carbon domains both increased, which, in turn, promoted the growth of the average grain size of turbostratic carbons and disorders.

EIS data interpretation for BCAM's (After 1000 cycles)

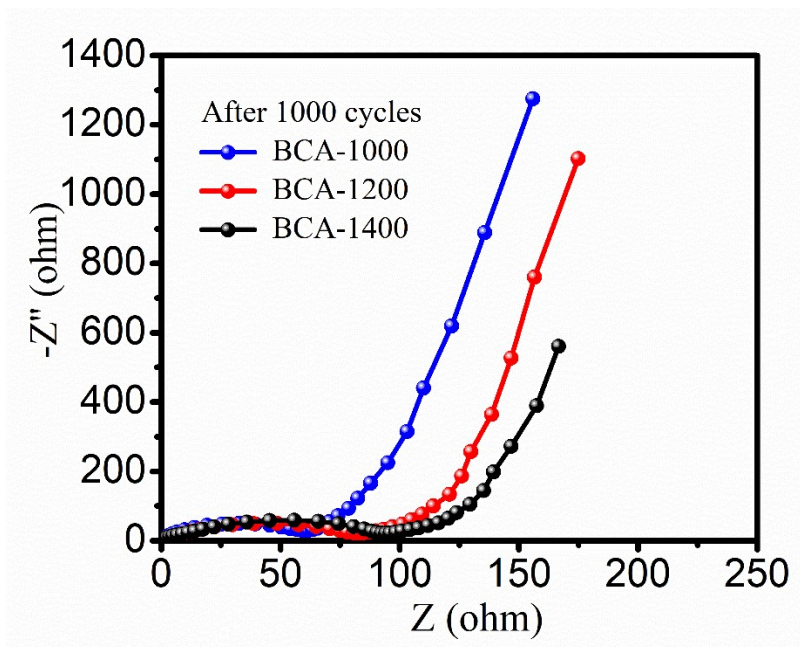


Fig. S2 Electrochemical impedance spectroscopic (EIS) results of Blister derived anode carbon materials (BCAM's) after cycles of measurements in the frequency range of 100 kHz-0.01 Hz.

Table S1: Comparison table of some waste material derived carbon for lithium ion**batteries**

	Type of carbon material	BET surface area (m ² g ⁻¹)	Discharge capacity (mAh g ⁻¹)	Capacity retention	Ref.
Waste materials to carbon	Waste Tire Derived Carbon Material	-	432 (0.1C)	94% after 80cycles (0.1C)	1
	Waste Tire Derived Carbon	369	350 (300 mAg ⁻¹)	81 % capacity retention after 500 cycles (300 mAg ⁻¹)	2
	HDPE-C Polyethylene Waste derived carbon	673.5	440 (1C)	270 mAh g ⁻¹ after 500 cycles C/5 rate	3
	S700 Activated carbon from e-waste plastics	496.96	362 (3 mAg ⁻¹)	~150 mAh g ⁻¹ after 50 cycles 10 mA g ⁻¹	4
	SM-AC Green tea wastes	1241	498 (0.1C)	86 % after 100 cycles (0.1C)	5
Present Work	BCA-1400-Blister pack waste derived carbon	11.4	594 (0.1C)	89 % after 2000 cycles (1C)	-

References

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