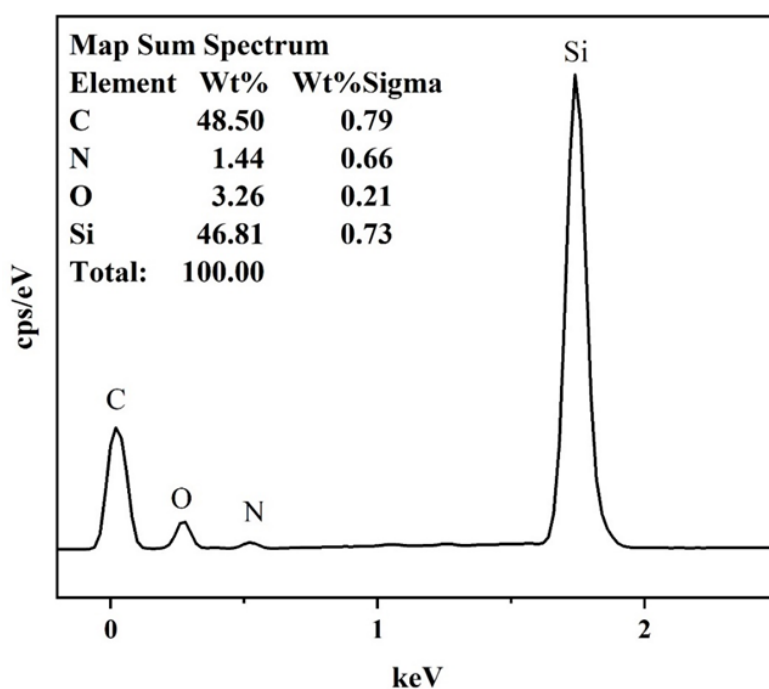


Supporting Information

From Biomass to Batteries: The Contribution of Silicon-Carbon Composites Prepared from High-Nitrogen Egg Whites and Micron-Sized Silica Powder to Lithium-Ion Battery Performance

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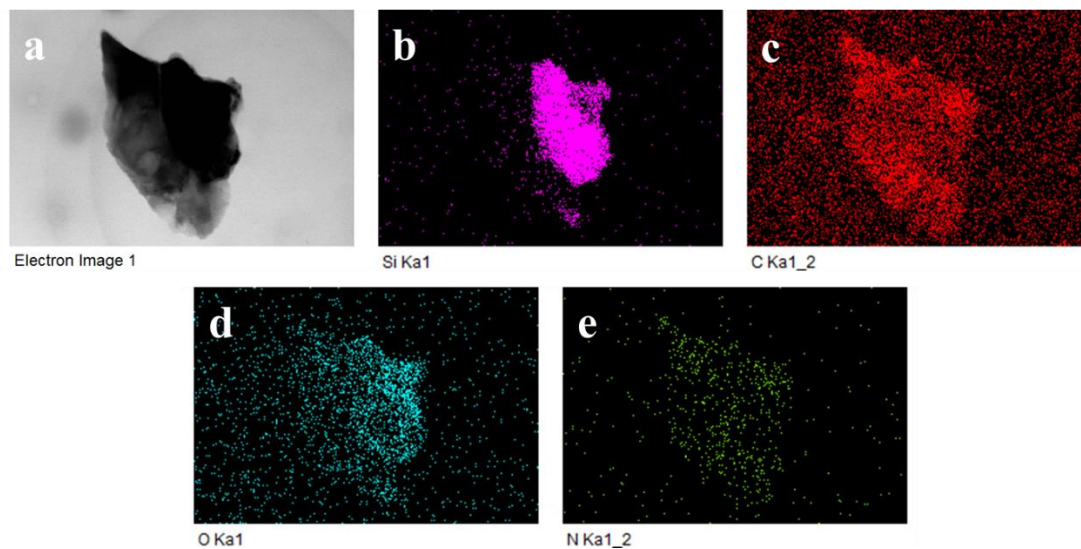
S1. Analysis of EDS element content on Si-N-PC material surface.

Table.1 Experimental materials and reagents

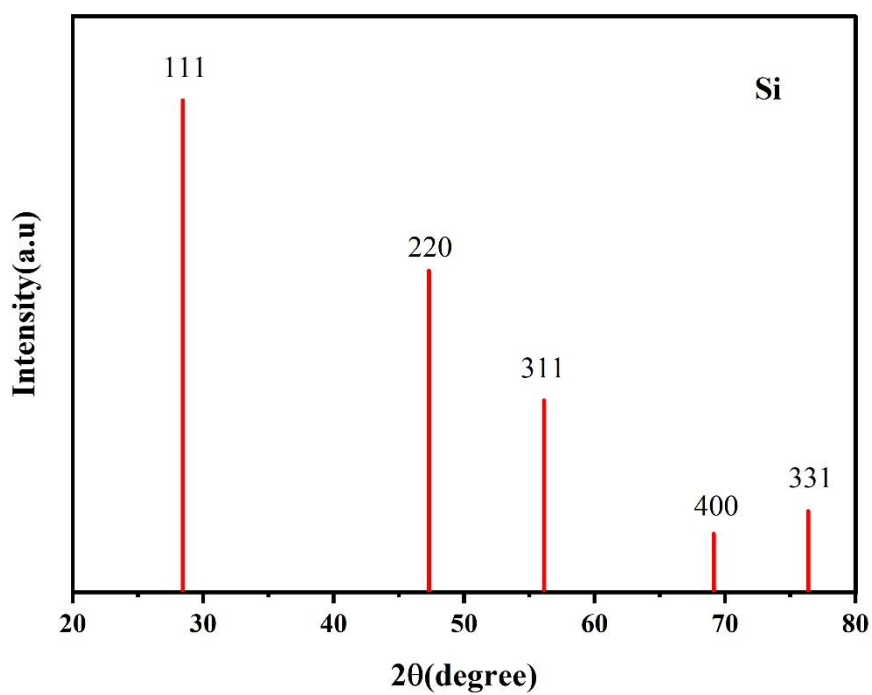
Name (chemical formula/abbreviation)	Purity level	Manufacturer
CR2032 battery case	99.9%	Shenzhen Bonap Technology Co., Ltd.
Lithium metal sheet (Li)	Battery grade	Guangdong Candlelight New Energy Technology Co., Ltd.
Diaphragm	Battery grade	Suzhou Duoduo Chemical Technology Co., Ltd.
Electrolyte	battery grade	Suzhou Duoduo Chemical Technology Co., Ltd.
Gasket	Battery grade	Shenzhen Bonap Technology Co., Ltd.
Shrapnel	Battery grade	Shenzhen Bonap Technology Co., Ltd.
Dimethyl carbonate (DMC)	99.9%	Guangdong Candlelight New Energy Technology Co., Ltd.
Deionized water (DI)	-	Guizhou University Key Laboratory of High Performance Battery Materials
Absolute ethanol (C ₂ H ₅ OH)	AR	Sinopharm Chemical Reagent Co., Ltd.
Acetylene black	Battery grade	Guangdong Candlelight New Energy Technology Co., Ltd.
Unidirectional copper foil (Cu)	Battery grade	Aladdin Reagents Ltd.
Micron silicon (PMSi)	99.9%	Xinai Metal Materials Co., Ltd.
Egg	-	Walmart Supermarket (Guiyang Jiaxiu South Store)
Hydrochloric acid (HCl)	AR	Chuangdong Chemical Industry Group
Argon (AR)	99.9%	Guiyang Shenjian Gas Co., Ltd.
Sodium alginate (SA)	AR	Aladdin Reagents Ltd.

Remark:

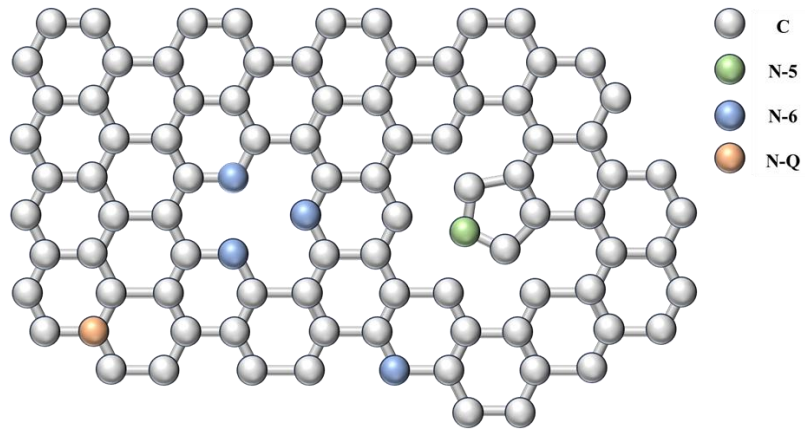
1. The amount of electrolyte used (45 microliters); 2. The lithium sheet specification is 16*0.6mm - purity 99.95%;



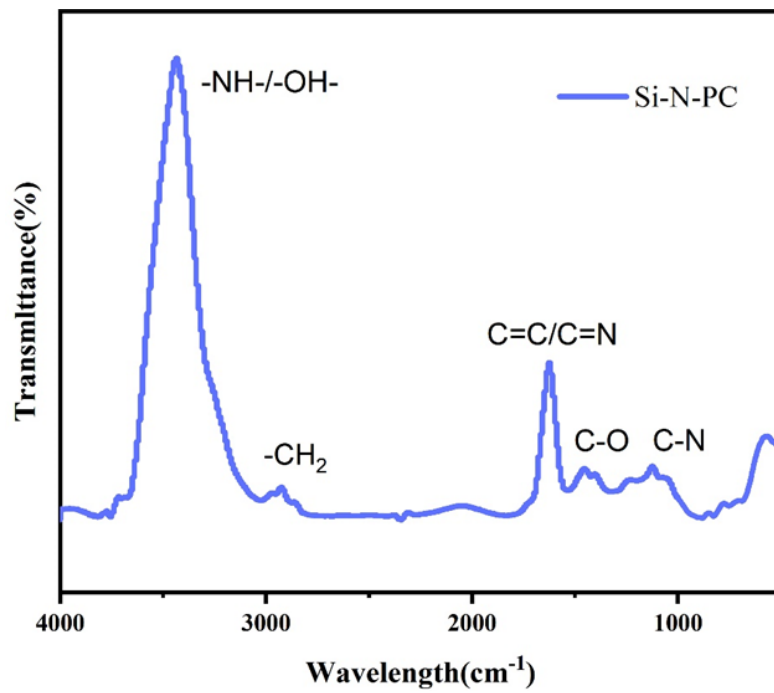
S2. (a) TEM image of a random position of Si-N-PC composite material (b-e) TEM EDS mapping pattern of the elements (Si, C, O, N) contained in this position.



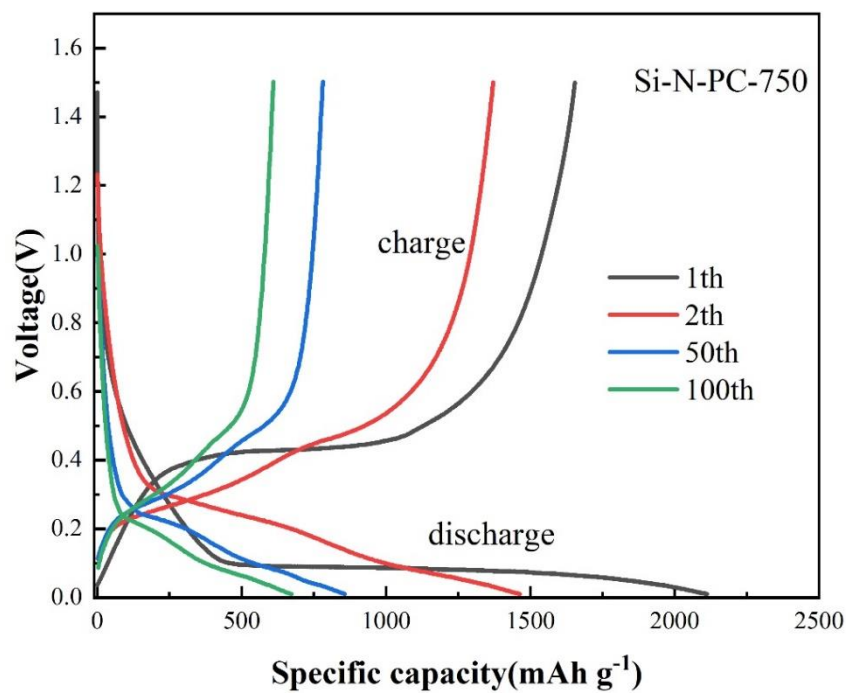
S3. Standard reference data pattern of silicon in XRD pattern.



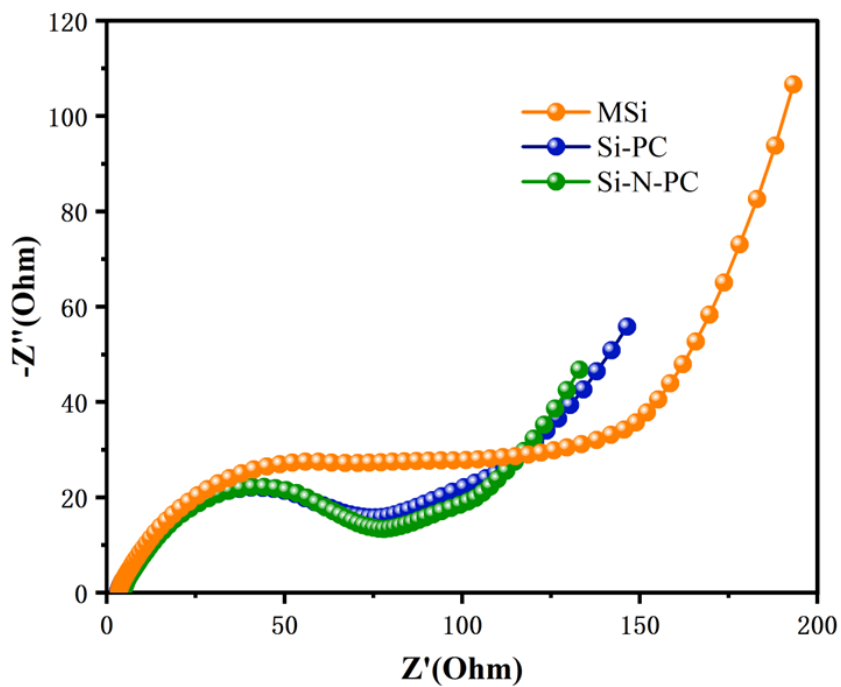
S4. The structural form of N in the carbon layer of Si-N-PC material.



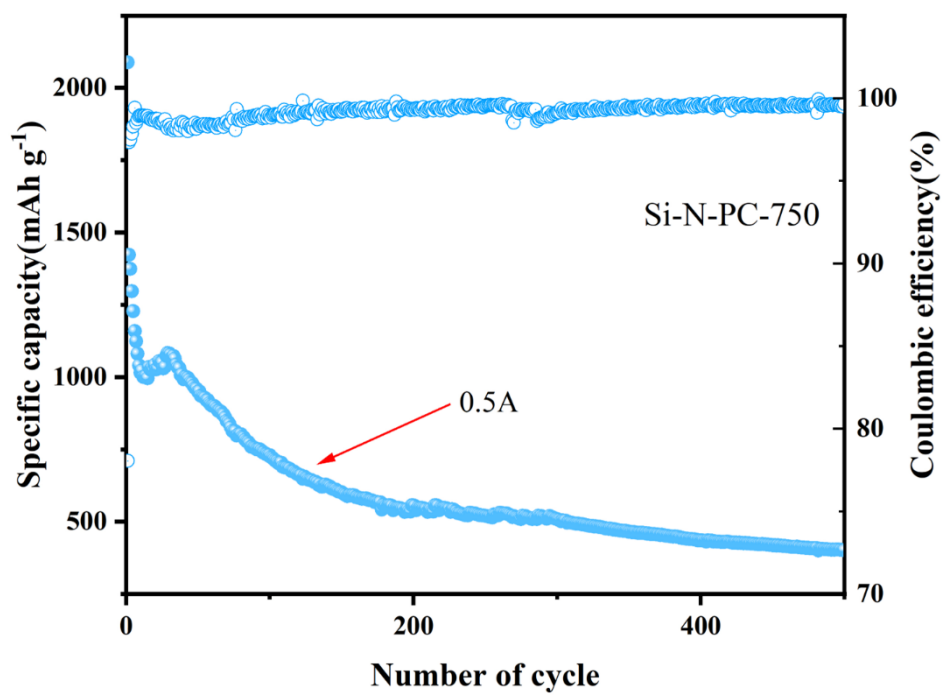
S5. Fourier transform infrared spectroscopy was used to analyze the existence of functional groups on the surface of Si-N-PC materials.



S6. Analysis of the charge and discharge curve of Si-N-PC material from the first cycle to the 100th cycle.



S7. EIS spectra of MSi,,Si-PC, Si-N-PC electrode materials after one cycle.



S8. Long cycle curve of Si-N-PC-750 electrode material at current density of 0.5A g⁻¹.