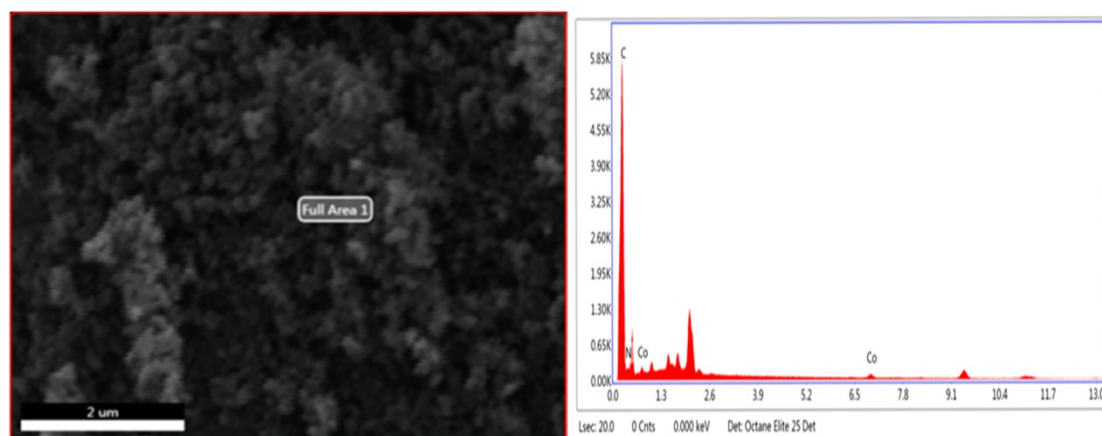


## Supporting Information

**Rational design of Co<sub>4</sub>N nanoparticle into porous carbon as a sulfur matrix for advanced lithium-sulfur batteries**



Element	Weight %	Atomic %
C K	74.92	78.86
N K	22.91	20.68
Co K	2.17	0.47

**Fig. S1** The EDS by SEM of KJ-Co<sub>4</sub>N .

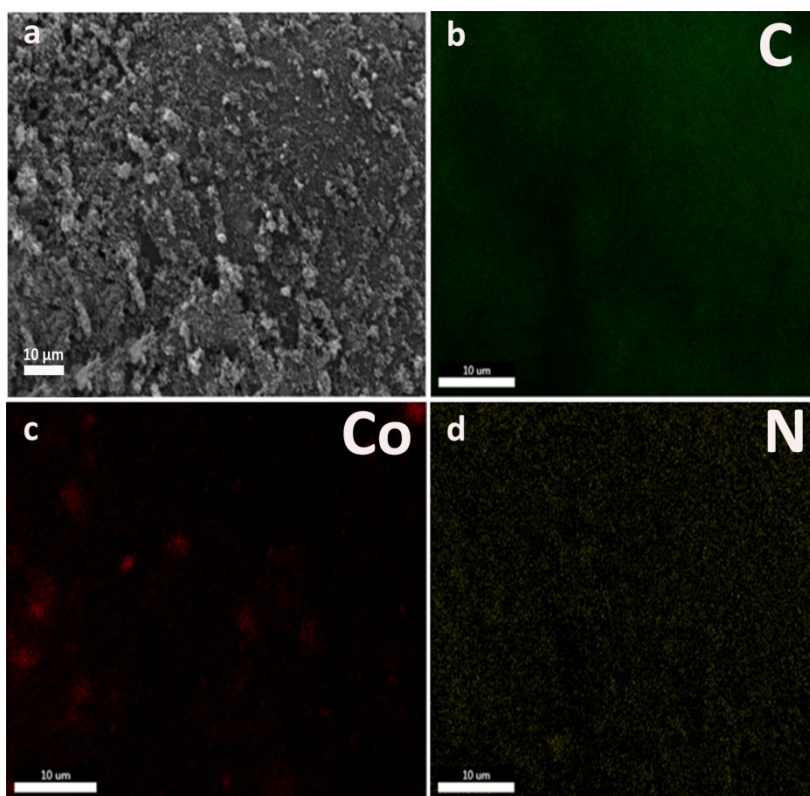


Fig. S2 (a-d) SEM image and corresponding elemental mappings of KJ-Co<sub>4</sub>N.

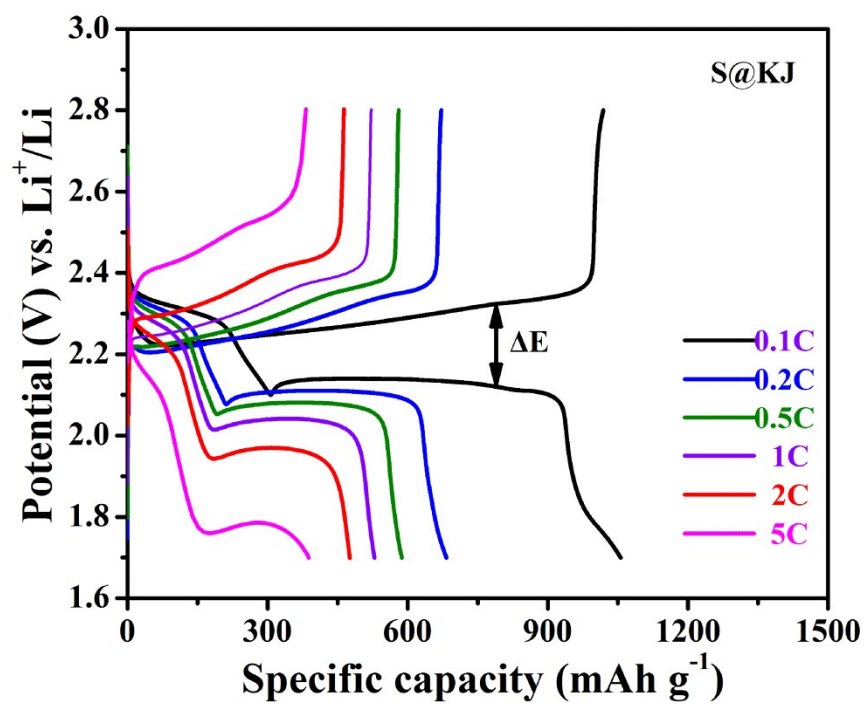
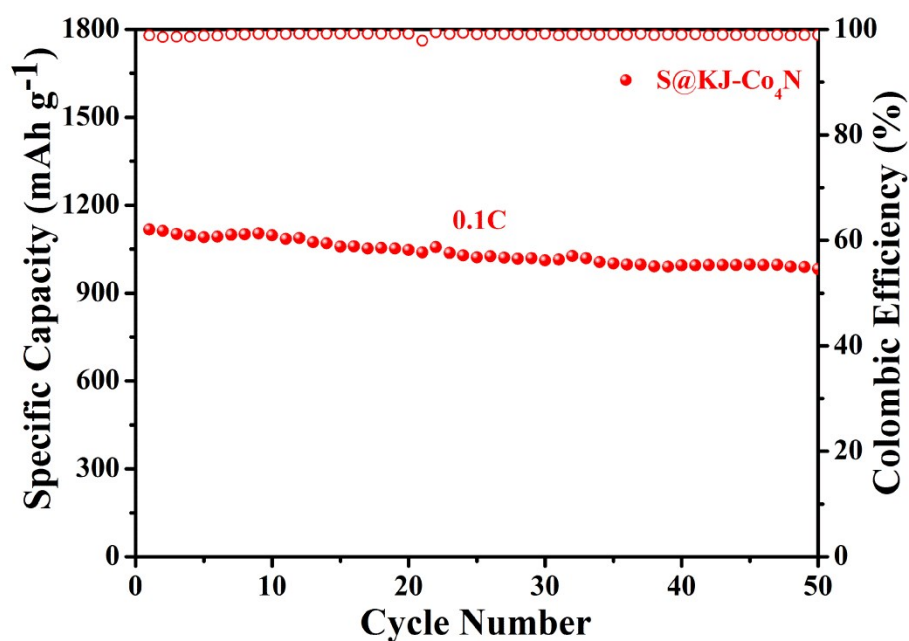


Fig. S3 Charge and discharge voltage profiles of the S@KJ cathode for the first cycle at current densities of 0.1, 0.2, 0.5, 1, 2, and 5 C.



**Fig. S4** Long-term cycling performance and Coulombic efficiency of the S@KJ-Co<sub>4</sub>N cathode at 0.1 C.

Sulfur host	rate	cycles	Final Capacity (mAh g <sup>-1</sup> )	References
La <sub>2</sub> O <sub>3</sub> @rGO@S	1C	100	618.6	Ref. S1
BC@S@AlF <sub>3</sub>	0.5C	100	869	Ref. S2
S@TiO <sub>2</sub> @GA	1C	200	540	Ref. S3
ZnO@rGO@S	0.1C	100	949	Ref. S4
Co-NiSe <sub>2</sub> @NC-S	0.5C	200	544.6	Ref. S5
S@KJ-Co <sub>4</sub> N	0.5C	200	739	This Work
	1C	400	575.1	

**Table S1.** Comparison of cyclabilities of previous excellent works and our reports on Li-S batteries.

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