Supplementary Materials

A long-life reversible Li-CO$_2$ batteries with optimized Li$_2$CO$_3$ flakes as discharge products on palladium-copper nanoparticles

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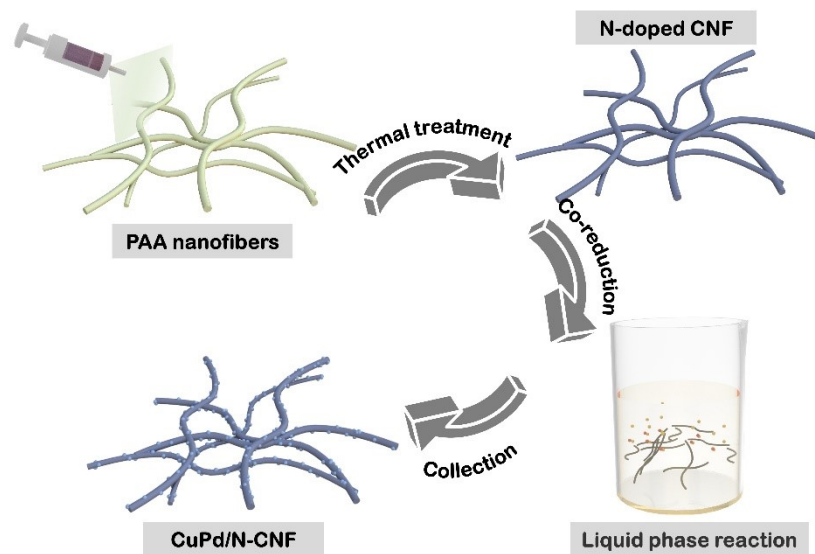
Supplementary Figures and Tables

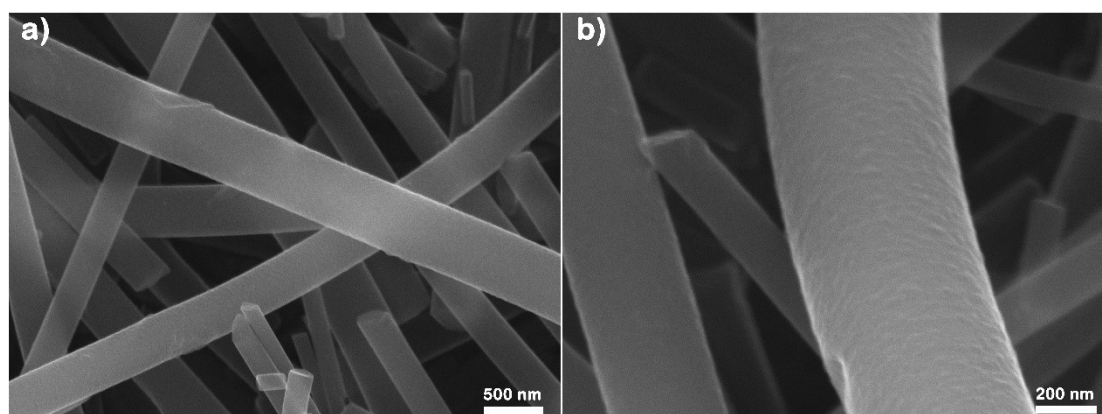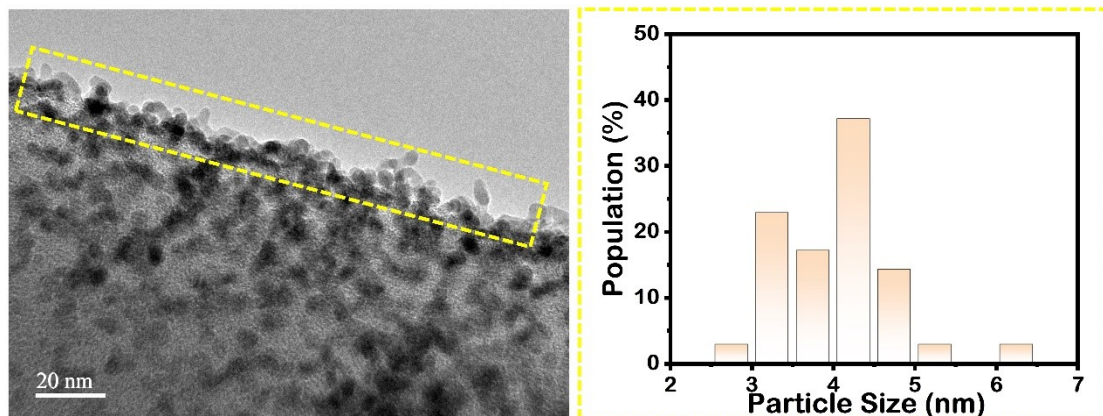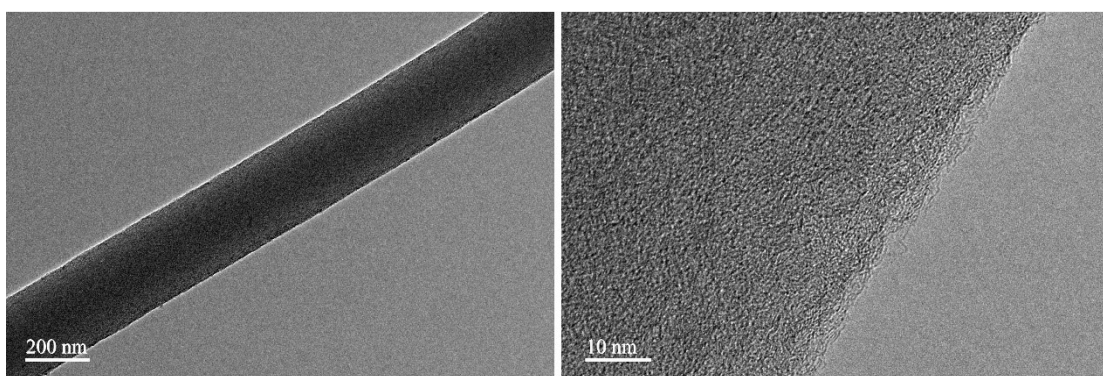**Fig. S**1. Schematic diagram of CuPd/N-CNF sample

Fig. S2. SEM images of the PAA nanofiber after thermal treatment.

Fig. S3. The TEM images of the PdCu/N-CNF and the graph of particle size distribution obtained from the yellow marked area.

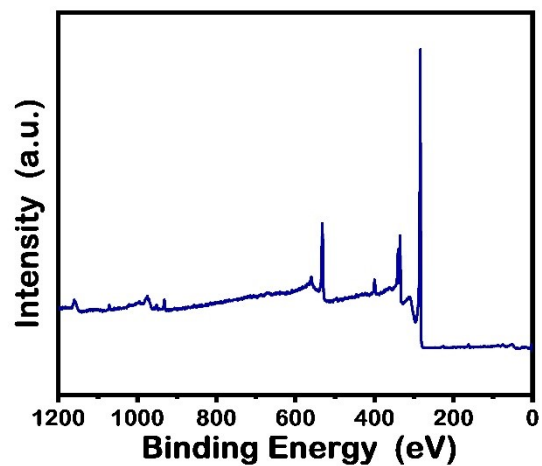**Fig. S**4. HR-TEM images of the nitrogen droped carbon nanofiber.

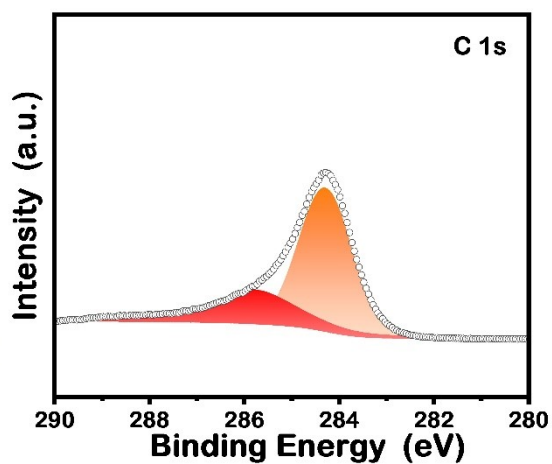**Fig. S**5. The XPS survey spectra and C 1s spectra of the PdCu/N-CNF.

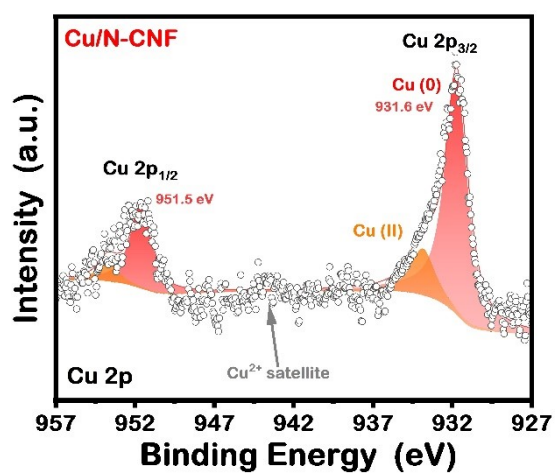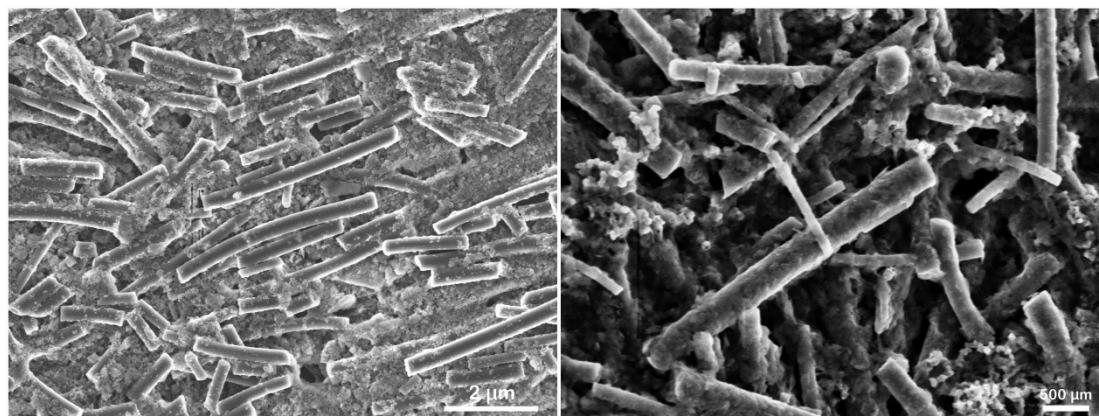**Fig. S**6. The C 1s spectra of the PdCu/N-CNF.

Fig. S7. The Cu 2p spectra of the Cu/N-CNF.

Fig. S8. The SEM analysis of cathode after discharged to 2.3 V.

Table S1. Comparison of the electrochemical performances of PdCu/N-CNF with reported cathode materials for Li-CO_2 batteries.

Cathode	Capacity/mAh g^{-1} (Current density/mA g^{-1})	Cycle number (Cycle time/hours)	Reference
PdCu/N-CNF	18550 (100)	>250th (1350)	This work
Ru/Co-CPY@CNT	24740 (200)	180th (720)	*Cell Reports Physical Science* **2021**, 2 (10), 100583.
Co-CeO$_2$/Graphene	7860 (100)	100th (1000)	*Energy Storage Mater.* **2021,** *42*, 484-492.
RuRh/VC72	9600 (200)	180th (360)	*Matter* **2020**, 2 (6), 1494-1508.
Ru-Co/Graphene	13698 (200)	100th (500)	*Adv. Energy Mater.* **2019,** *9* (8), 1802805.
Co/GO	17358 (100)	100th (1000)	*Adv. Funct. Mater.* **2019,** *29* (49), 1904206.
ZnS/N-rGO	10310 (100)	190th (950)	*Adv. Energy Mater.* **2019,** *9* (34), 1901806.