## **Electronic Supplementary Information**

## Preparation of novel silicon/nitrogen-doped graphene composite nanosheets by

## DC arc discharge

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Fig. S1 shows the XRD patterns of (a) the mixture of SiO<sub>2</sub>, graphite and binder, which was used to prepare the anode, and (b) the as-prepared anode. The diffraction peaks at about 31.03°, 49.7°, 52.12°, 64.46° and 71.1° are matched well with graphite (PDF Card No. 00-008-0415). The peaks at 24.25°, 31.03°, 42.67°, 46.12°, 47.15°, 49.7°, 53.7°, 58.9°, 64.74°, 65.27°, 71.1° and 75.98° can be attributed to quartz (PDF Card No. 86-2237).



Figure S1. XRD patterns of (a) the mixture of  $SiO_2$ , graphite and binder, which was used to prepare the anode, and (b) the as-prepared anode. The semi-quantitative analysis shows that the anode consists of graphite and  $SiO_2$ .



Figure S2. TG-DSC curves of the sample of the as-prepared anode.

## Calculation of Si content in the as-prepared anode

Primary weight of the sample of the as-prepared anode = 4.17 mg

Weight loss at 1200  $^{\circ}$ C = 34.18 wt.%

Weight remained at 1200  $^{\circ}C = 65.82 \text{ wt.\%}$ 

Supposing the residual is SiO<sub>2</sub>.

Atomic weight of Si= 28.09 amu

Atomic weight of oxygen= 16.00 amu

Weight of the residual (SiO<sub>2</sub>) at 1200 °C=  $4.17 \times 65.82 \% = 2.74 \text{ mg}$ The weight of Si in the residual at 1200 °C =  $\frac{28.09}{60.09} \times 2.74 = 1.28 \text{ mg}$ Si content in the as-prepared anode =  $\frac{1.28}{4.17} \times 100 \text{ wt.\%} = 30.7 \text{ wt.\%}$ 



**Figure S3**. The schematic diagram of the modified arc discharge apparatus used in our experiment. The main parts of this diagram is the Fig. 1 in the published paper [S. Cui, P. Scharff, C. Siegmund, et al., Carbon,2004, 42, 931] (Reproduced with permission. Copyright@2004, Elsevier). The modified parts are shown in the red frames and marked with red arrows and words.





The inset in Fig. 2 of the text was cut from (c).