

Electroless plating of Sn-Ni/graphite sheets composite with improved cyclability as anode material for lithium ion batteries

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Table. S1 Chemical compositions of activation bath

Solution	Concentration
PdCl ₂	0.2 g L ⁻¹
HCl	2.5 ml L ⁻¹

Table. S2 Chemical compositions of electroless nickel plating bath

Solution	Concentration
NiSO ₄ ·6H ₂ O	8 g L ⁻¹
NaH ₂ PO ₂ ·H ₂ O	15 g L ⁻¹
C ₆ H ₈ O ₇ ·H ₂ O	15 g L ⁻¹
CH ₃ COONa	20 g L ⁻¹
CH ₃ COONH ₄	20 g L ⁻¹
OP	0.1g

Table. S3 Chemical compositions of electroless tin plating bath

Solution	Concentration
SnCl ₂ ·H ₂ O	12 g L ⁻¹
H ₂ NCSNH ₂	100 g L ⁻¹
HCl	20 ml L ⁻¹
NaH ₂ PO ₂ ·H ₂ O	10 g L ⁻¹

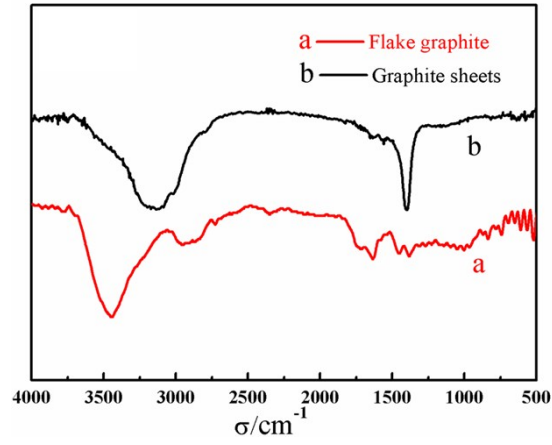


Fig. S1 The FT-IR spectra of flake graphite and oxidized graphite sheets.

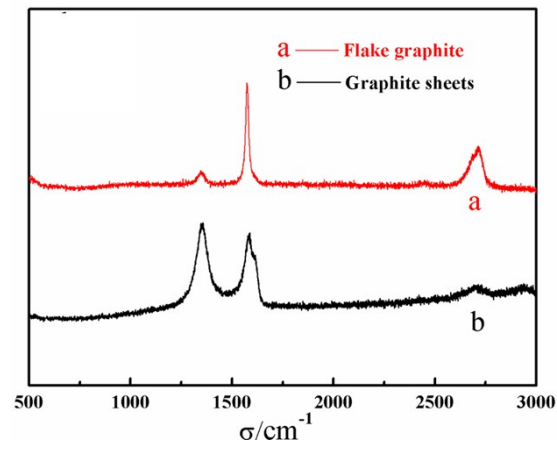


Fig. S2 The Raman spectra of flake graphite and oxidized graphite sheets.

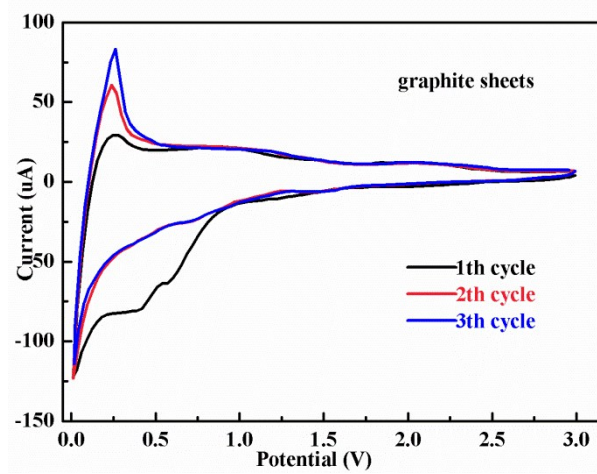


Fig. S3 The first three CV curves of the graphite sheets

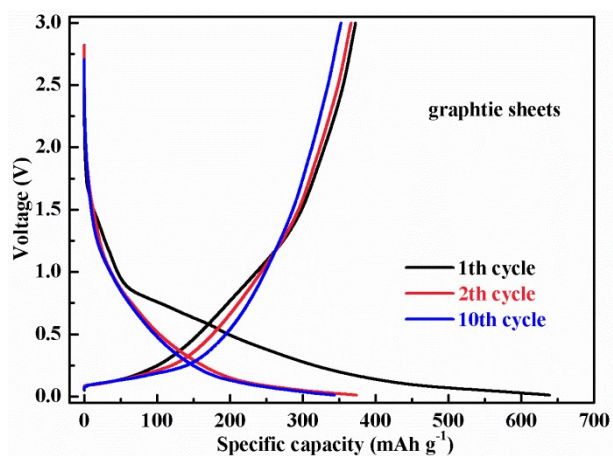


Fig. S4 The discharge-charge curves of graphite sheets at the current density of 0.1 A g^{-1}

Table. S4 The capacities of the graphite sheets, Sn/graphite sheets, Ni/graphite sheets and Sn-Ni/graphite sheets electrodes at the end of each rate (The unit of Specific capacity: mAh g^{-1} , Current density: A g^{-1})

Sample	0.1	0.2	0.5	1	2	5	10	0.2	continuous 100 cycles at 0.1
graphite sheets	356.6	318.7	248.1	196.5	146.2	85.9	50.0	408.4	487.9
Ni/graphite sheets	433.1	403.2	351.1	290.1	197.5	99.8	55.8	413.3	506.6
Sn/graphite sheets	466.9	439.2	384.5	316.7	231.1	130.6	100.9	461.4	530.4
Sn-Ni/graphite sheets	637.4	586.3	466.7	371.5	273.6	165.3	97.3	712.3	802.4