Supplementary material (ESI) for Journal of Materials Chemistry

Supporting Information for

SnO_2-NiO-C nanocomposite prepared *via* a molten salt and carbon layering process: a high capacity anode material for lithium-ion batteries.

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Figure S1

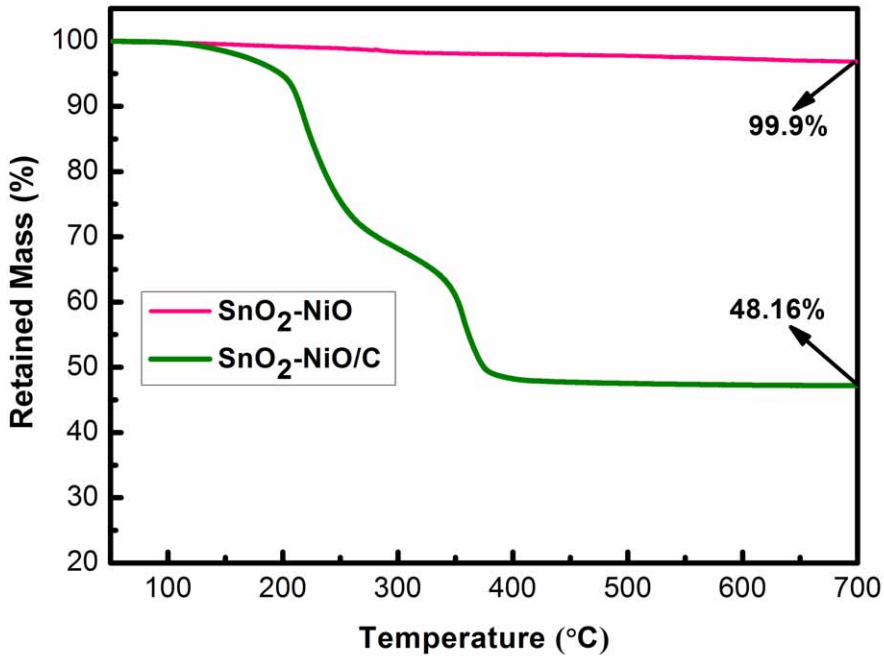

Fig. S1. TGA results for SnO_2-NiO and SnO_2-NiO-C samples.

For quantifying the amount of amorphous carbon in the SnO_2-NiO-C nanocomposite material, TGA was carried out in air. The samples were heated from 50 to 700 ^oC at a rate of 5^o C/min. As can be seen from Figure S1, SnO_2-NiO-C nanocomposite powders starts to lose weight slowly with increasing temperature, with the maximum weight loss around 150-450 ^oC, while the SnO_2-NiO powders remain stable over the entire temperature range. As the SnO_2-NiO powders remain stable over the temperature range, any weight change corresponds to the oxidation of amorphous carbon.[1] Therefore, the change in weight before and after the oxidation of carbon directly translates into the amount of amorphous carbon in the SnO_2-NiO-C nanocomposite. With the use of this method, it was estimated that the amount of amorphous carbon in the composite was approximately 51.84 wt. %, which was attributed to the decomposition of malic acid ($C_4H_6O_5$) in the precursor.

Figure S2

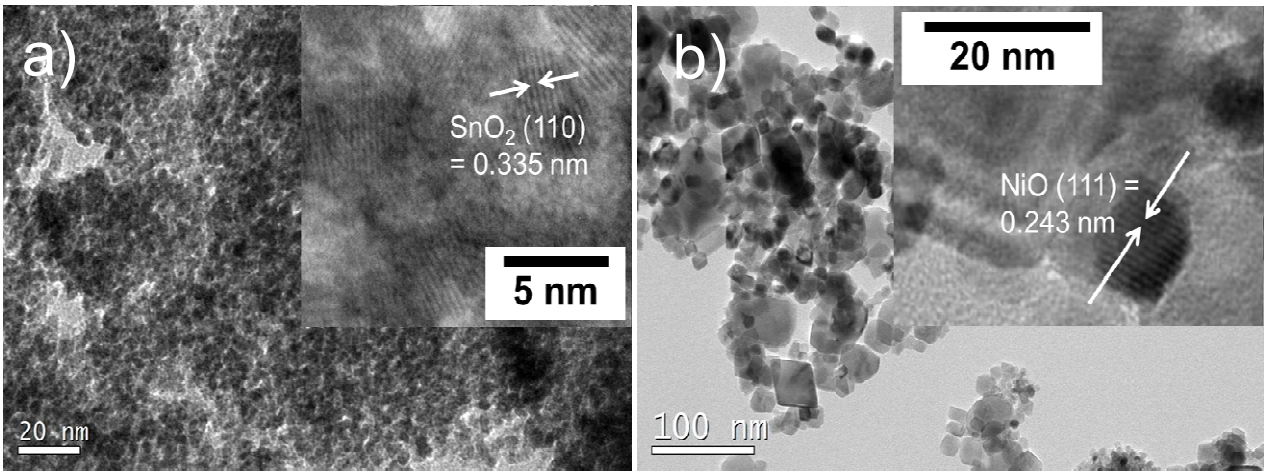

Fig. S2. TEM images of individual SnO_2 (a) and NiO (b) powders, with the magnified insets showing the corresponding d-spacing value.

Figure S3

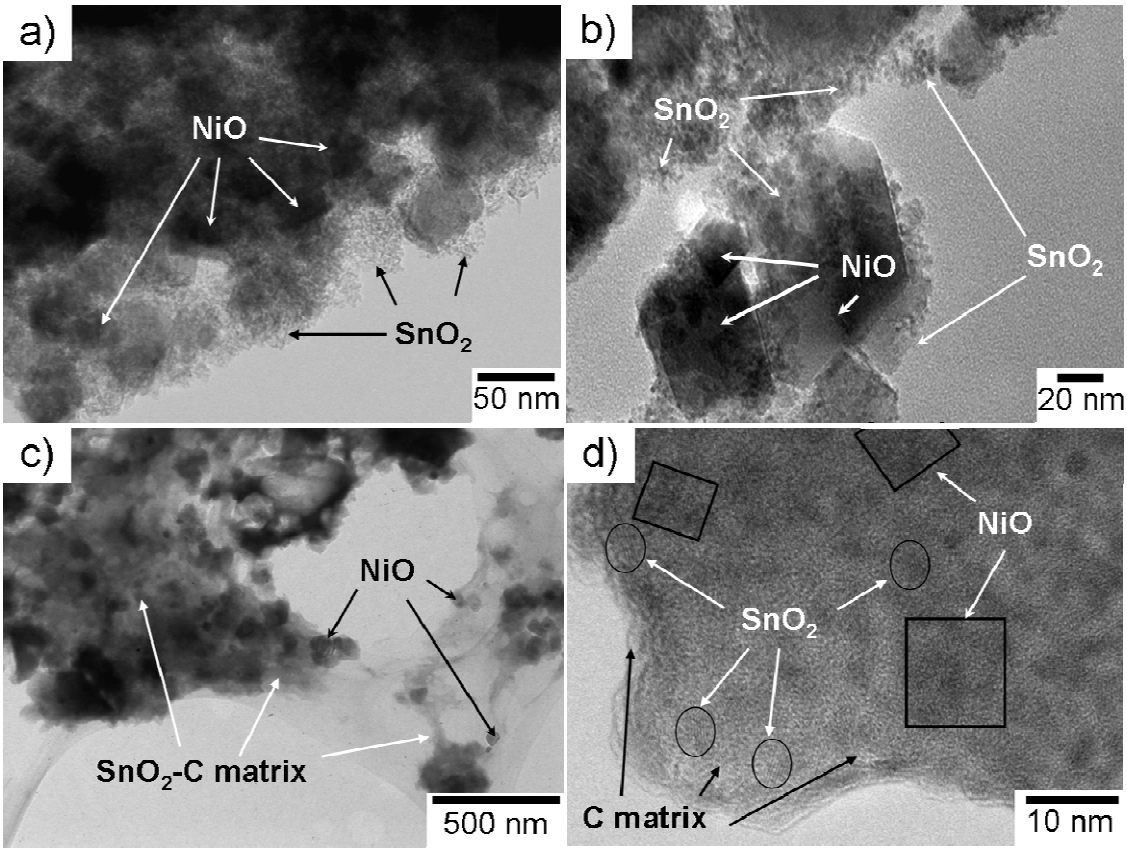

Fig. S3. TEM images of SnO_2-NiO (a, b) and SnO_2-NiO-C (c, d) powders at different magnifications.

Table S1: The crystal sizes along three crystallographic directions for the SnO_2-NiO and SnO_2-NiO-C composite samples.

SnO_2-NiO

SnO_2 (hkl)	Crystal sizes (nm)	NiO (hkl)	Crystal sizes (nm)
110	1.1	111	39.5
101	1.7	200	54.6
211	1.1	220	23.4

SnO_2-NiO-C

SnO_2 (hkl)	Crystal sizes (nm)	NiO (hkl)	Crystal sizes (nm)
110	1.6	111	59.2
101	1.8	200	89.9
211	1.2	220	25.9

Reference

[1] S.H. Ng, J. Wang, D. Wexler, S. Y. Chew, H. K. Liu, *J. Phys. Chem. C* 111(29) (2007) 11131.