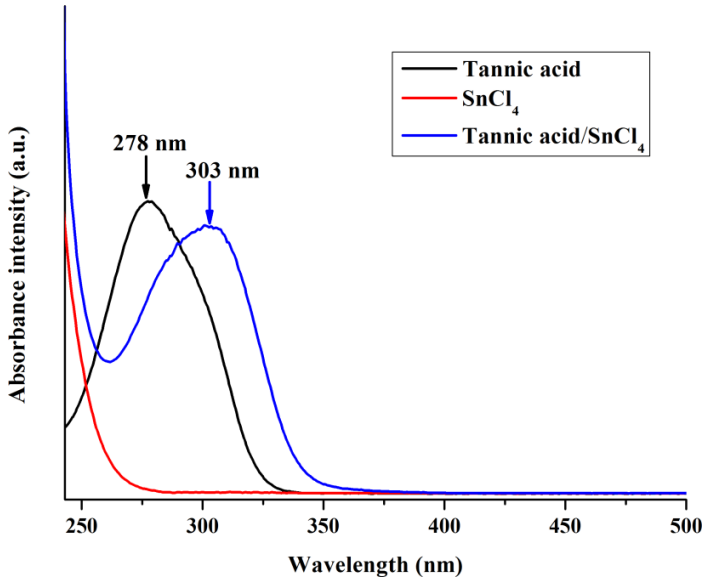
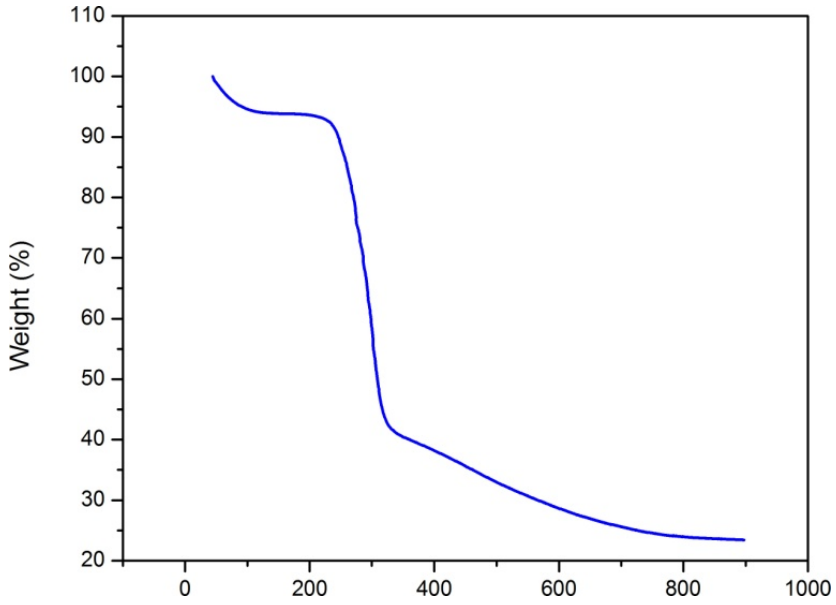
Supporting information

Electronic supporting information 1 (ESI, S1†):

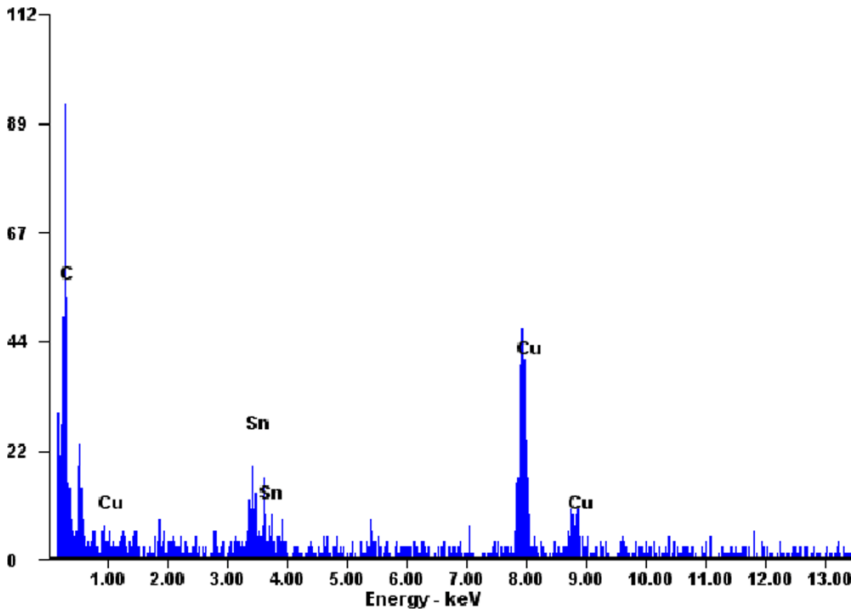
4.0 mg of tannic acid ($C_{76}H_{52}O_{46}$, Sigma-Aldrich) was dissolved in 1.0 mL of ethanol, and then mixed with 1.0 mL of ethanol containing 26.05 mg (52.1 mg or 104.2 mg) of Tin(IV) chloride hydrate ($SnCl_4 \cdot xH_2O$, Alfa Aesar). Subsequently, 4.0 mg of single wall carbon nanotubes (Sigma-Aldrich) was suspended in the above mixture solution, and treated by ultrasonication for 1.0 h, followed by vacuum-dried at 50 ^oC. The collected samples were calcined at 200 ^oC for 2.0 h in Ar/H_2 flow. Finally, the nano-Sn1/CNTs (the nano-Sn2/CNTs or the nano-Sn3/CNTs) were obtained by thoroughly washing with deionzed water and ethanol, followed by vacuum-dried at 50 ^oC.



ESI, S2†. Ultraviolet-visible (UV-vis) spectra of $SnCl_4$, tannic acid and their mixture in ethanol.



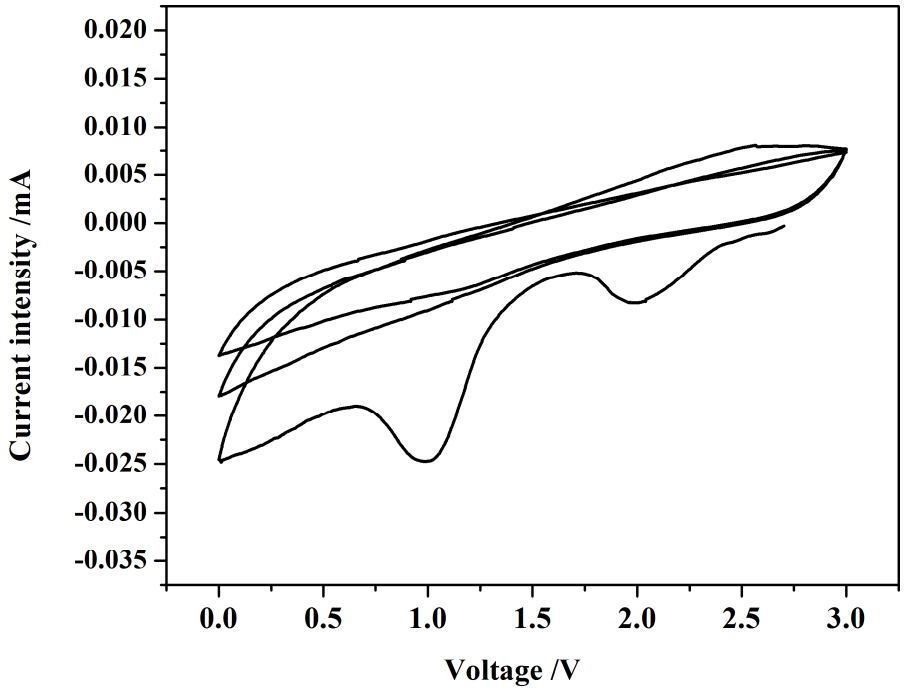
ESI, S3†. TGA spectrum of tannic acid.



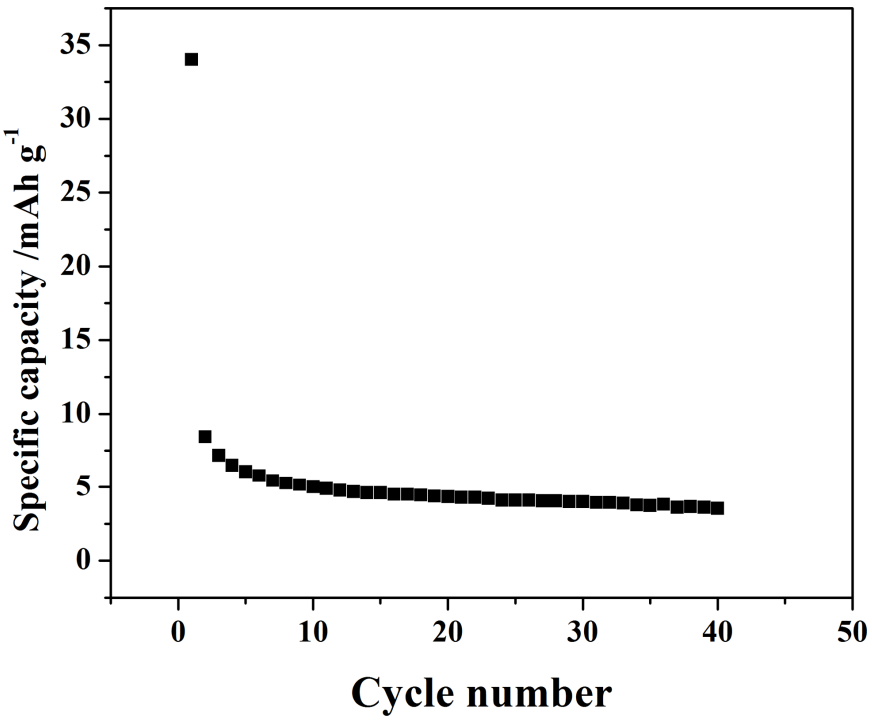
ESI, S4†. EDX spectrum of the nano-Sn1/CNTs.

ESI, S5†:

Electrochemical measurement: 90 wt% of the nano-Sn/CNTs and 10 wt% polyvinylidene fluoride (PVDF) binder were fully mixed into N-methyl-2-pyrrolidinone (NMP). The resultant slurry was coated onto Cu foils, and vacuum-dried at 50 ^{o}C to completely remove the solvent. The electrochemical properties of the obtained working electrodes were measured using two-electrode CR2032 (3 V) coin-type cells with lithium foil serving as both counter and reference electrodes under ambient temperature. The electrolyte was 1 M $LiPF_6$ in a 50: 50 (w/w) mixture of ethylene carbonate (EC) and dimethyl carbonate (DMC). Cell assembly was carried out in an argon-filled glove box with both moisture and oxygen contents below 1.0 ppm. Galvanostatic charge/discharge tests were performed using a NEWARE battery tester at a voltage window of 0.005-3 V.



ESI, S6†: Cycle voltammogram curves of tannic acid in the voltage window of 0-3.0 V.



ESI, S7†: The cycling performance of the tannic acid-Sn composite (The tannic acid-Sn composite was prepared using the same procedures adopted for the synthesis of the nano-Sn1/CNTs without the use of CNTs).