CoO-carbon nanofiber networks prepared by electrospinning as binder-free anode materials for lithium-ion batteries with enhanced properties

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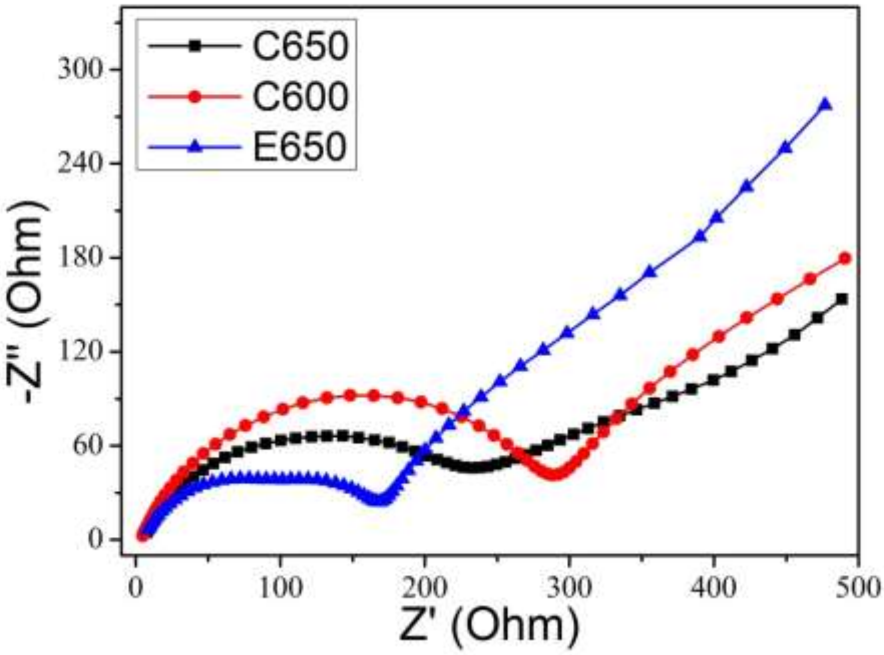

Fig. S1 AC impedance spectra of the coin cells after the rate capacity test.

The intercept on the Z real axis in the high-frequency range corresponds to the resistance of the electrolyte (R_e) (high-frequency). R_{ct} is the charge-transfer resistance (medium-frequency). The sloping line at the low-frequency range represents the Warburg impedance (Z_w). As shown in Fig. Si, the R_e of the three samples (C650, C600, and E650) are about 4.5 Ω, showing the consistency of electrolyte. The R_{ct} of the sample E650 is the smallest one among them, and the R_{ct} of the sample C600 is the largest one in the three samples. The R_e of E650 is lower than that of C650, demonstrating that the conductivity of carbon nanofibers is higher than that of CoO. However, the theoretical capacity of CoO is higher than that of carbon. Therefore, the rate capacity of C650 is high that of E650. The lower R_e of C650 arising from the higher annealed temperature results in that the rate capacity of C650 is higher than that of C600.