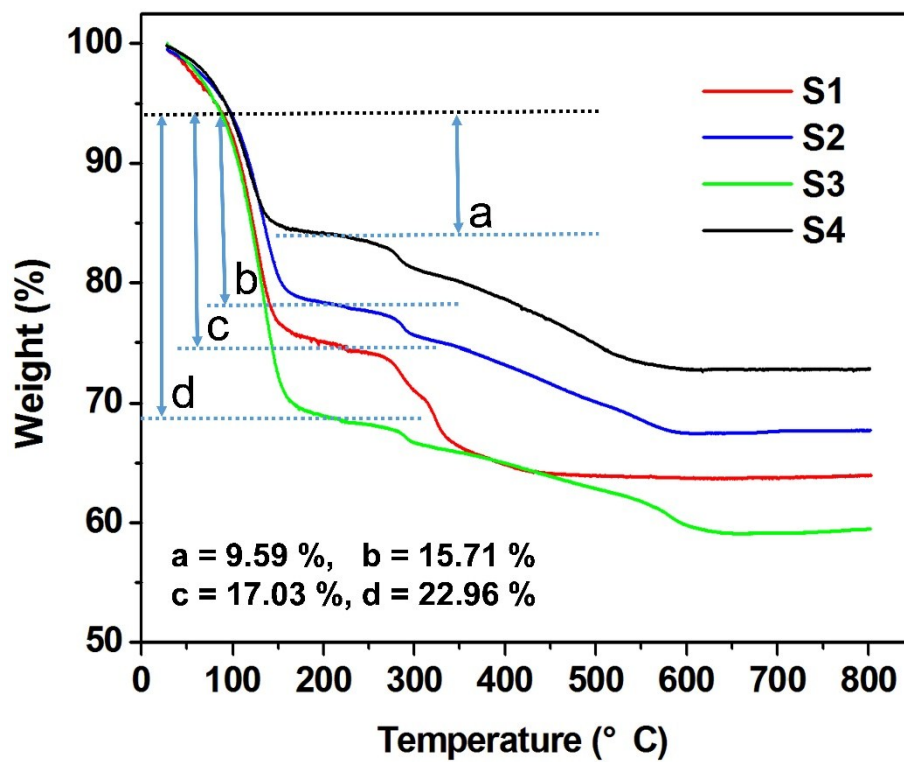
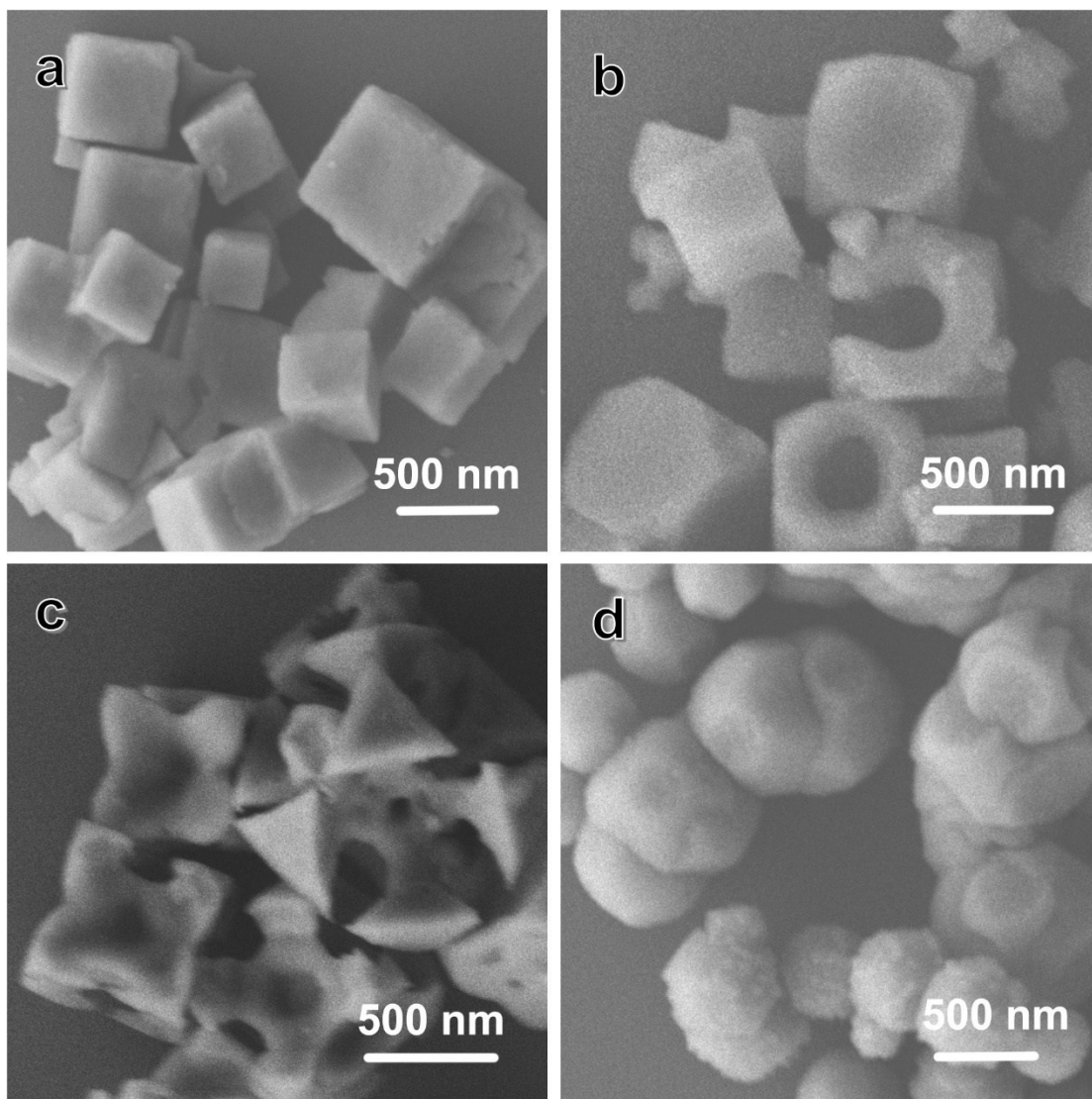


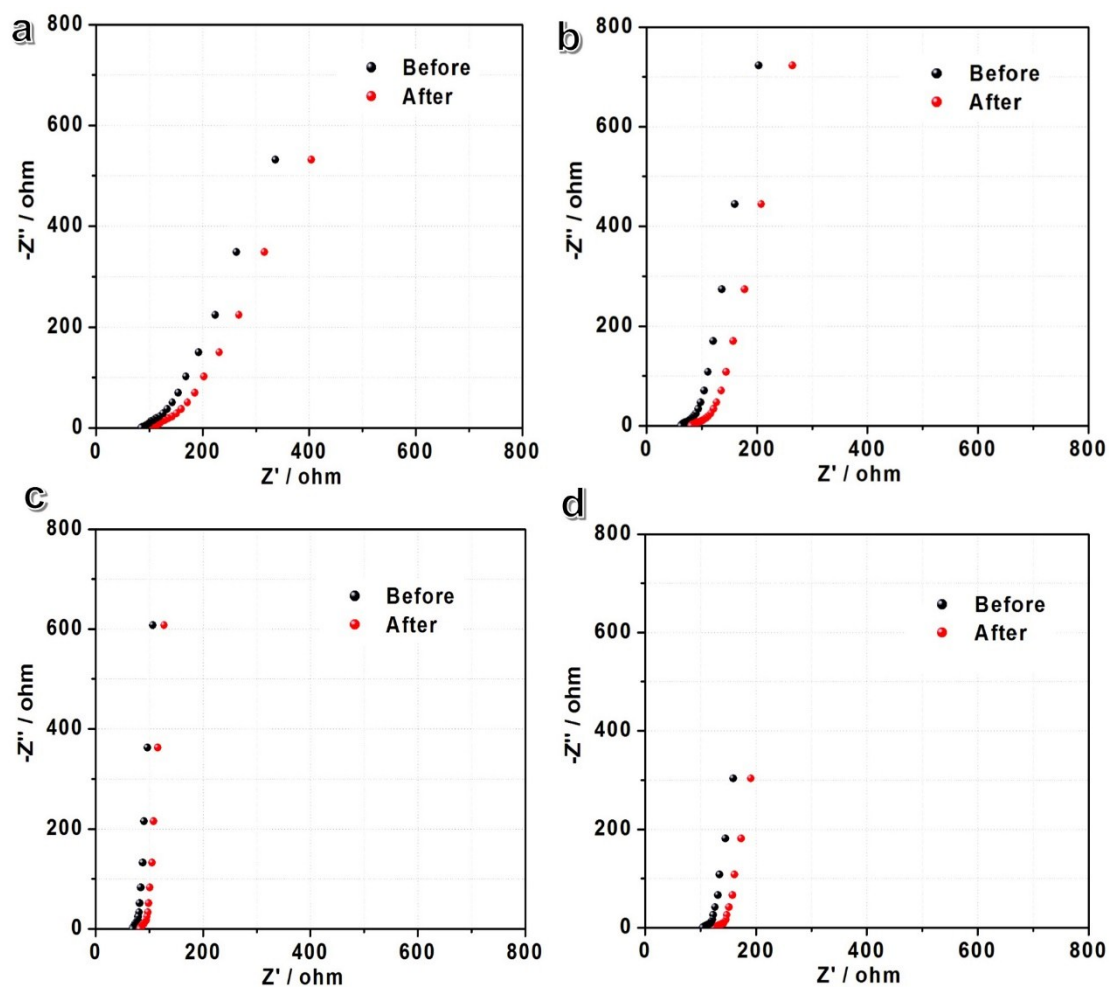
**Figure S1.** TEM images of as-prepared samples, a) S1, b) S2, c) S3, and d) S4.



**Figure S2.** the thermal gravimetric analysis (TGA) measurement of as-prepared samples.



**Figure S3.** SEM images of as-prepared samples after 7000 cycle in three-electrode system, a) S1, b) S2, c) S3, and d) S4.



**Figure S4.** The electrochemical impedance spectra (EIS) of the as-prepared electrodes before and after 7000 cycle: a) S1; b) S2; c) S3; and d) S4.