

Supporting information

Designed fabrication of three-dimensional δ - MnO_2 -cladded CuCo_2O_4 composites as an outstanding supercapacitor electrode material

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Supplementary method S1: As shown in Fig. 5b and S1, Trasatti method analysis was used to analyze the capacitance configuration of δ - MnO_2 -cladded CuCo_2O_4 . According to the theory of Dunn et al.^[1], the total current of the electrode at a fixed potential comprises two separate mechanisms, described by the equation of $i(V) = K_1v^{1/2} + K_2v$ and $i(V)/v^{1/2} = K_1 + K_2v^{1/2}$ (Eq. 1), based on the power law relationship of $i = av^{1/2}$ for Faradaic process arising from redox reactions, and $i = av$ for the capacitive-controlled processes. The current values at a fixed potential can be determined by the cyclic voltammograms at various scan rates of 5-20 mV s^{-1} . By drawing plots of $i(V) / v^{1/2}$ vs. $v^{1/2}$, the values of K_1 (intercept) and K_2 (slop) at a fixed voltage can be calculated. From this procedure, the series K_1 and K_2 values at different voltages can be quantified, thus the diffusion-controlled current ($K_1v^{1/2}$) and capacitive-controlled current (K_2v) be determined, respectively.

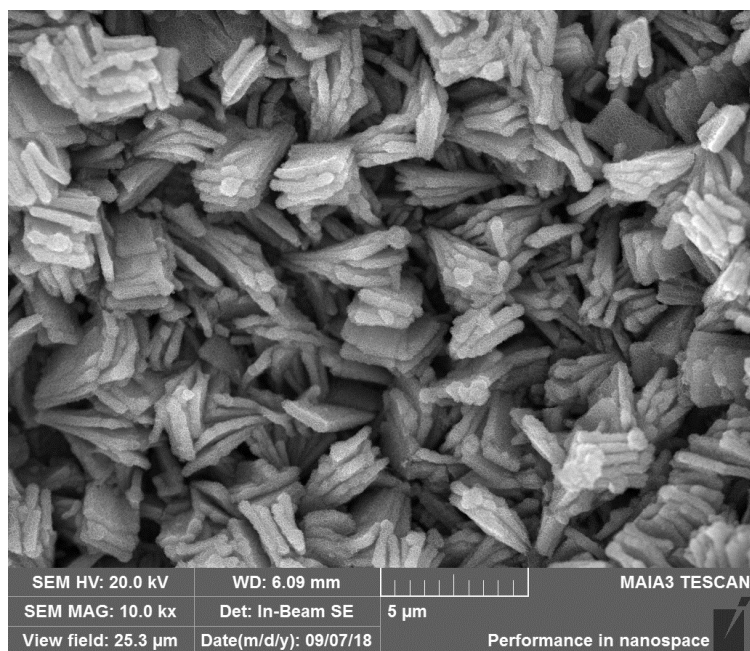


Fig. S1 SEM image of the CCO@MO electrode after 5000 cycles charge/discharge at 15 Ag^{-1} .

[1] J. Wang, J. Polleux, J. Lim, and B. Dunn, *J. Phys. Chem. C* 111 (2007) 14925-14931.