Supporting Information

Carbon dot engineered trimetallic hydroxyl carbonates: A strategy for enhanced Redox-Diffusion Coupled charge storage

*Tanzeem Fatema, Gaurav Singh, Darshna Potphode**

Department of Chemistry, Sunandan Divatia School of Science, SVKM's Narsee Monjee Institute of Management Studies (NMIMS) Deemed-to-be University, Mumbai 400 056, Maharashtra, India.

*Corresponding author email address:

drdarshnapotphode@gmail.com (D. Potphode)

Contact No.: +91 2242330364

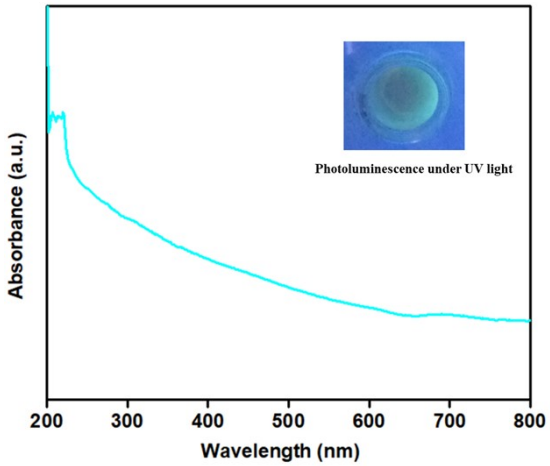

Figure S1: UV-Vis spectrum of carbon dots representing characteristic absorption under UV range.

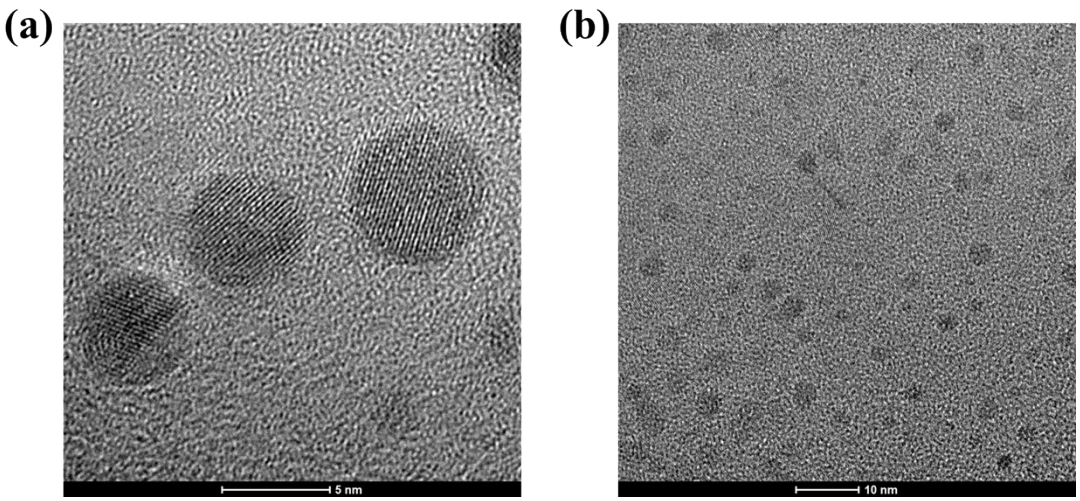

Figure S2: HR-TEM images of carbon dots synthesized from *Trachyspermum ammi* (Ajwain) leaves (a) at magnification of 5nm and (b) at magnification of 10nm.

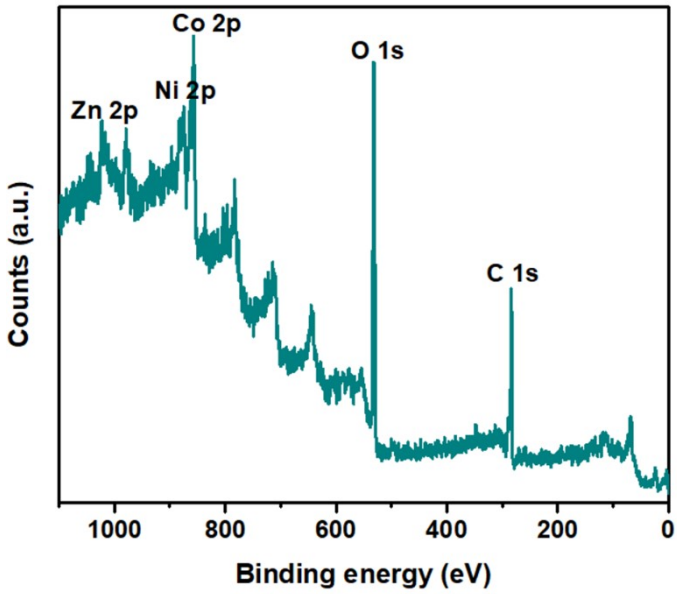

Figure S3: XPS full scan survey of CDMHC.

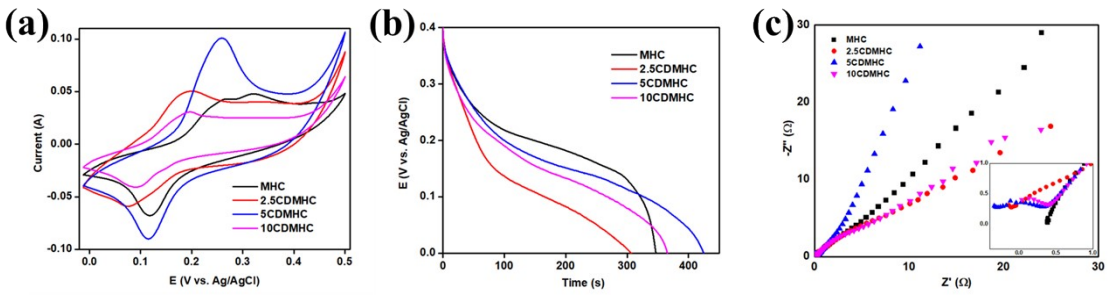

Figure S4. Comparative electrochemical performance of different compositions of CDMHC synthesized (a) CV at scan rate of 10 mV s^{-1}, (b) GCD at current density of 5 A g^{-1} and (c) Nyquist plot at 0 V with lowest R_s value shown by 5CDMHC.

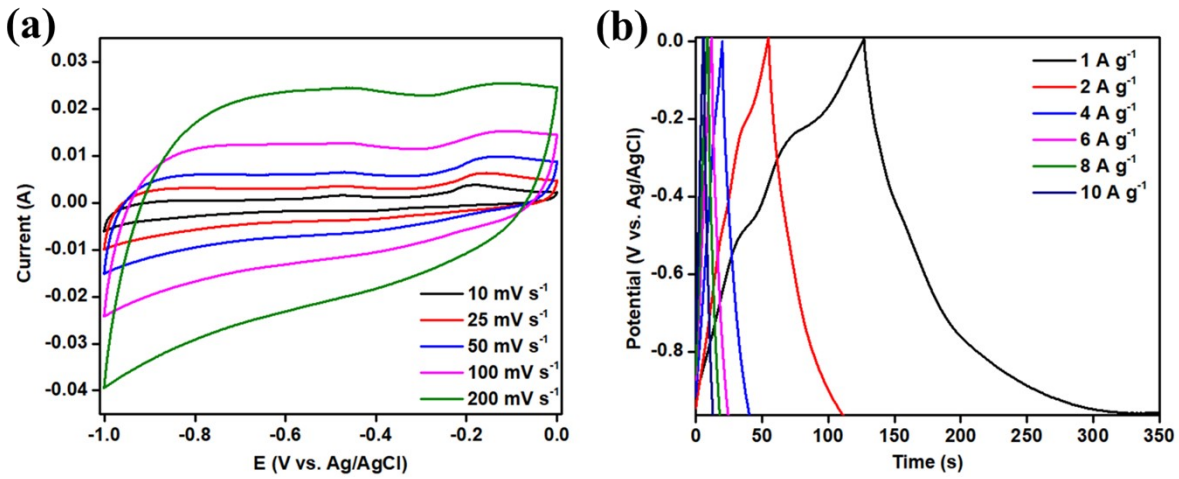

Figure S5. Electrochemical performance of commercial activated carbon used as anodic electrode material (a) CV curves at different scan rates of 10, 25, 50, 100 and 200 mV s^{-1}; (b) GCD at different current density of 1, 2, 4, 6, 8 and 10 A g^{-1}.

Anode mass optimization by charge balance equation for device fabrication:

$$\frac{m_+}{m_-} = \frac{C_- \Delta V_-}{C_+ \Delta V_-} \tag{S1}$$

where C is the specific capacitance, ΔV is the potential window, and m_+ and m_- are the active masses of positive and negative electrodes, respectively.

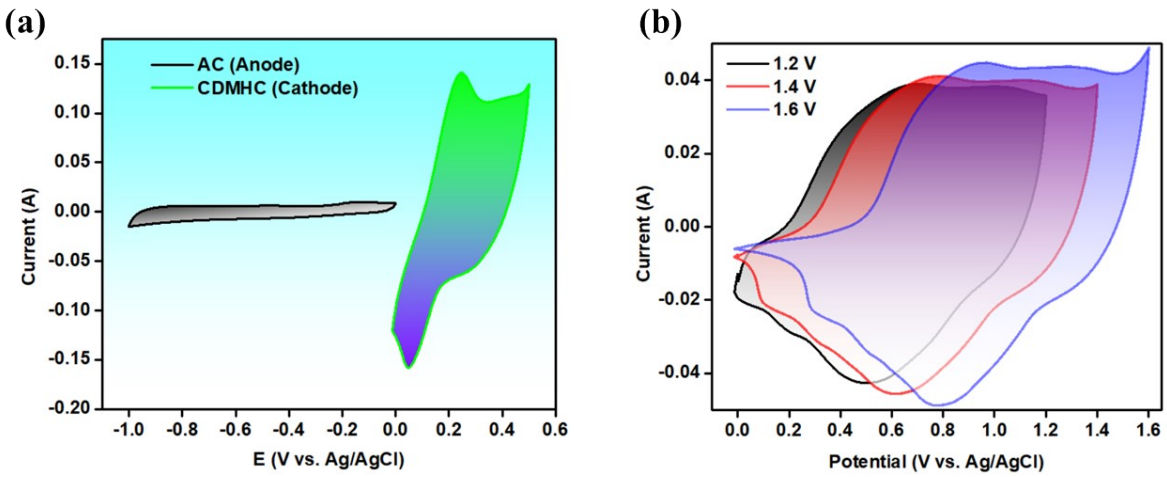

Figure S6: (a) CV curves at 50 mV s^{-1} for anode (AC) and cathode (CDMHC), (b) CV curves at varied potential window for AC//CDMHC hybrid device.