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Supporting Information

Hierarchical Aerogel-Confined Deep Eutectic Electrolytes for Complete Water Immobilization and High-Performance, Freeze-Tolerant Supercapacitors

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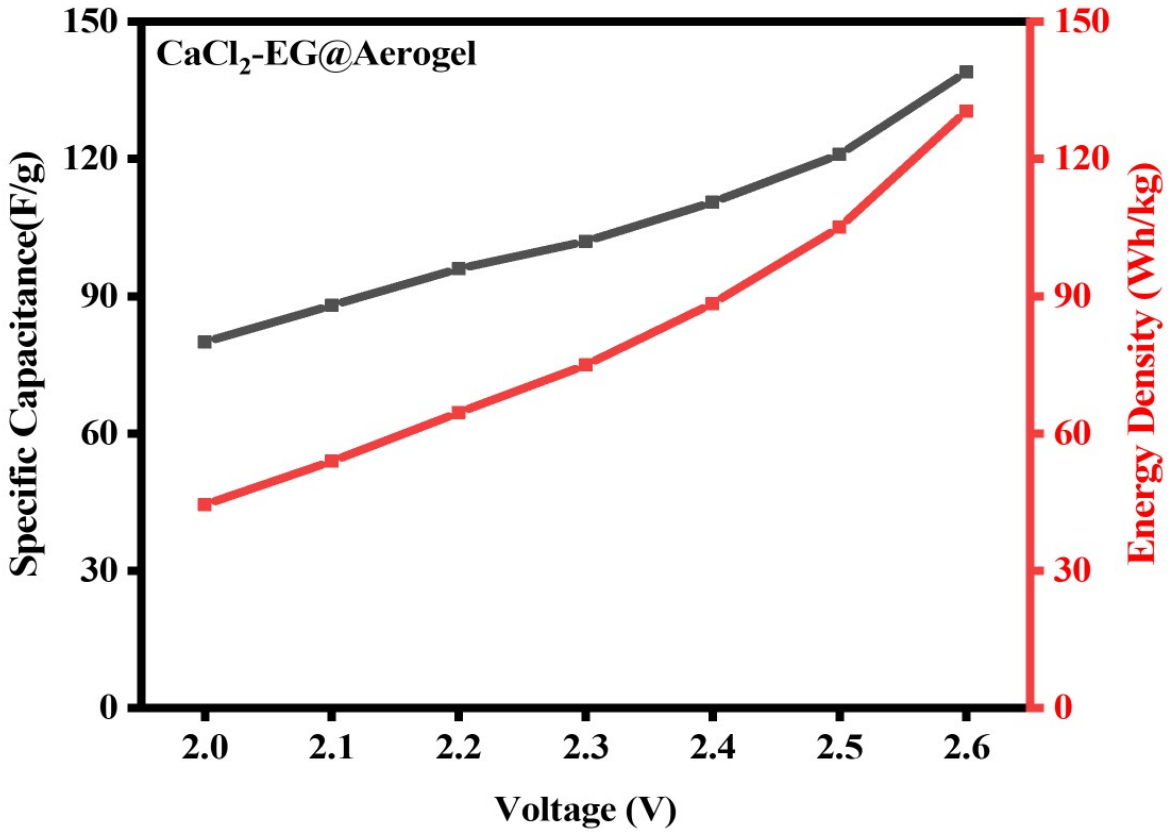

Figure S1: relation between Specific capacitance and Energy Density at different voltages

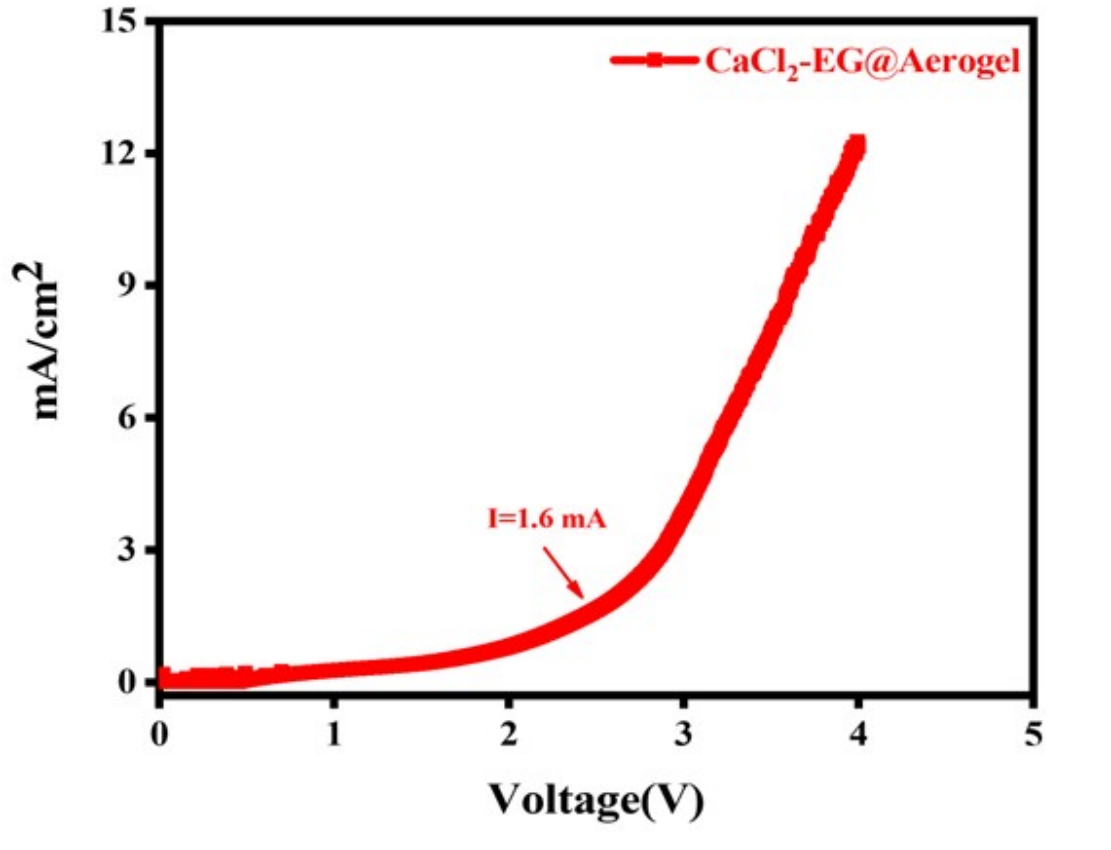

Figure S2: LSV curve for $CaCl_2$-EG@Aerogel

Table S1: the specific capacitance and energy density at different potential window

Voltage (V)	Specific Capacitance(F/g)	Energy Density (Wh/kg)
2	80	44.44
2.1	88	53.9
2.2	96	64.53
2.3	102	74.94
2.4	110.5	88.42
2.5	121	105.03
2.6	139	130.5

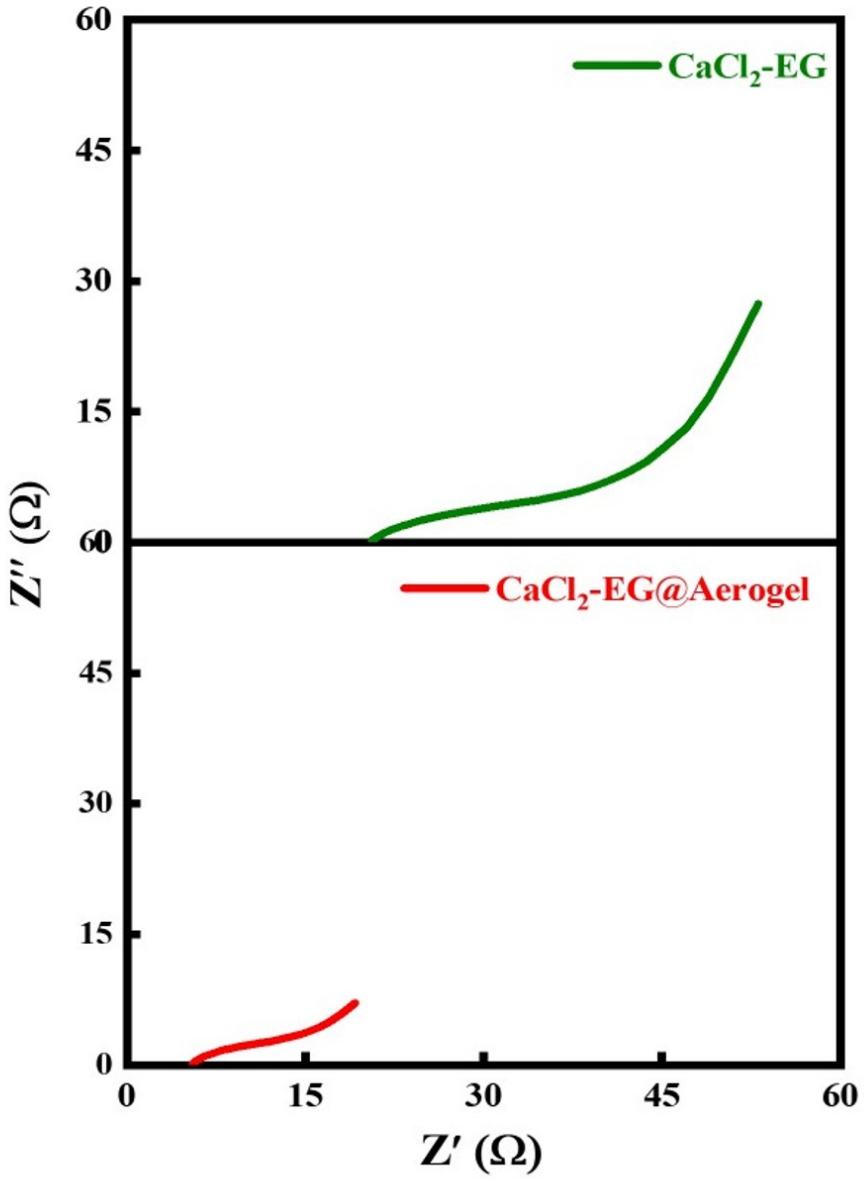

Figure S3: Nyquist plot for different electrolyte systems.

Table S2: Comparison between the two systems to illustrate the bulk and charge-transfer resistances.

Electrolyte	R_B (Ω)	R_{CT} (Ω)
$CaCl_2$-EG	20.8	15.6
$CaCl_2$-EG@Aerogel	5.6	10.4

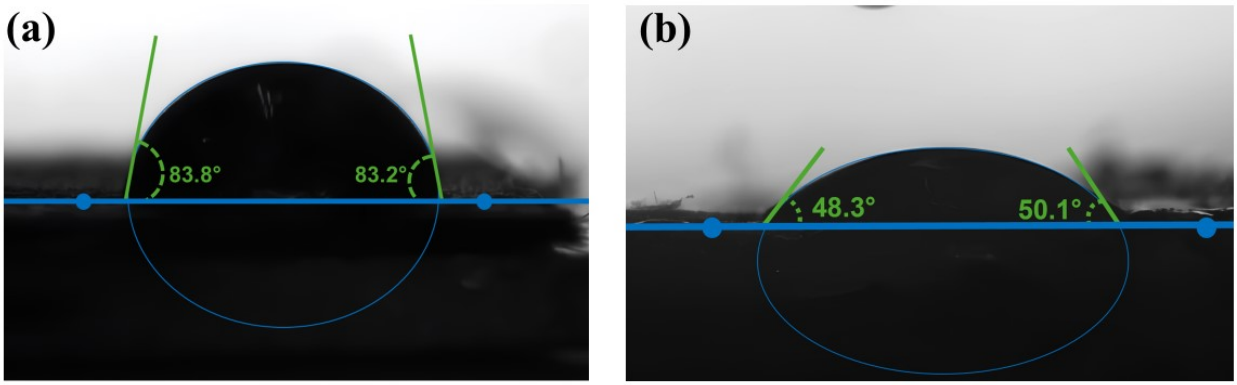

Figure S4. Contact angle measurements of (a) The $CaCl_2$-EG eutectic electrolyte on the carbon electrode. (b)The $CaCl_2$-EG electrolyte confined within the CMC aerogel.

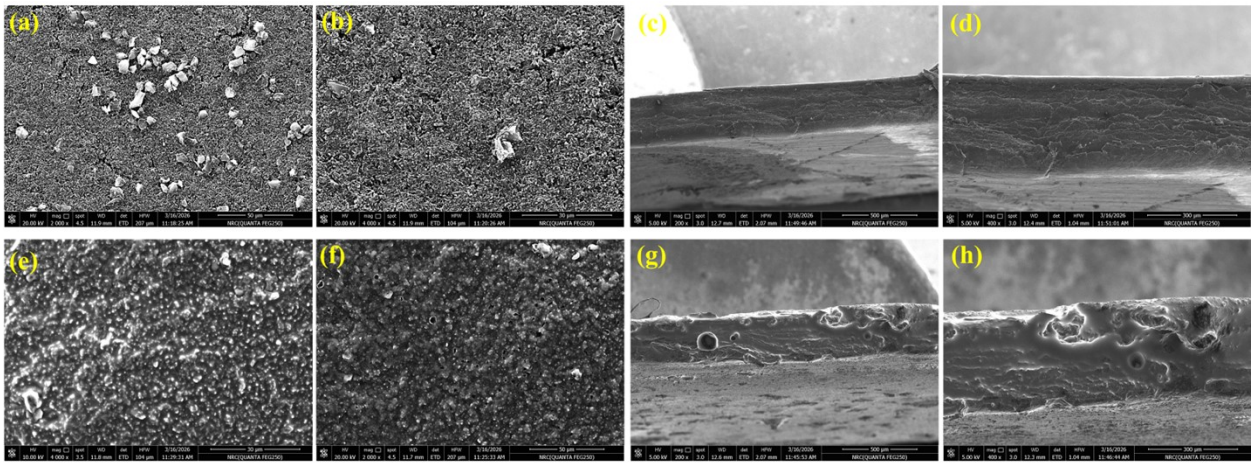

Figure S5: SEM analysis of electrode morphology and cross-section before and after electrochemical stability testing. (a-b) Surface morphology of the carbon electrode before cycling. (c-d) Cross-sectional SEM images of the electrode before stability testing. (e-f) Surface morphology of the electrode after long-term cycling stability tests. (g-h) Cross-sectional SEM images of the electrode after stability testing.

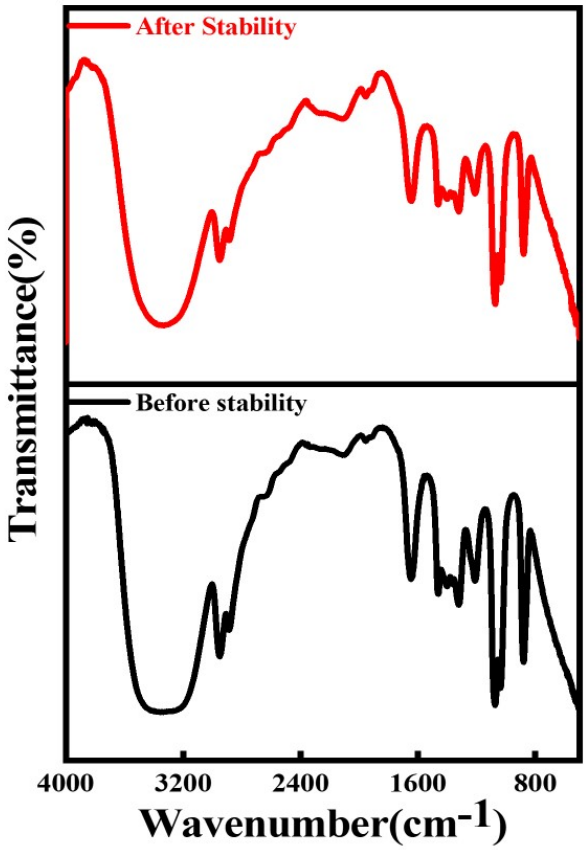

Figure S6. FTIR Spectra of $CaCl_2$-EG@CMC Aerogel Electrolyte Before and After Charge-Discharge Cycles.