ADVANCED ENERGY MATERIALS

Supporting Information

for *Adv. Energy Mater.*, DOI: 10.1002/aenm.201300160

A High Capacity Calcium Primary Cell Based on the Ca–S System

*Kimberly A. See, Jeffrey A. Gerbec, Young-Si Jun, Fred Wudl, Galen D. Stucky, and Ram Seshadri**

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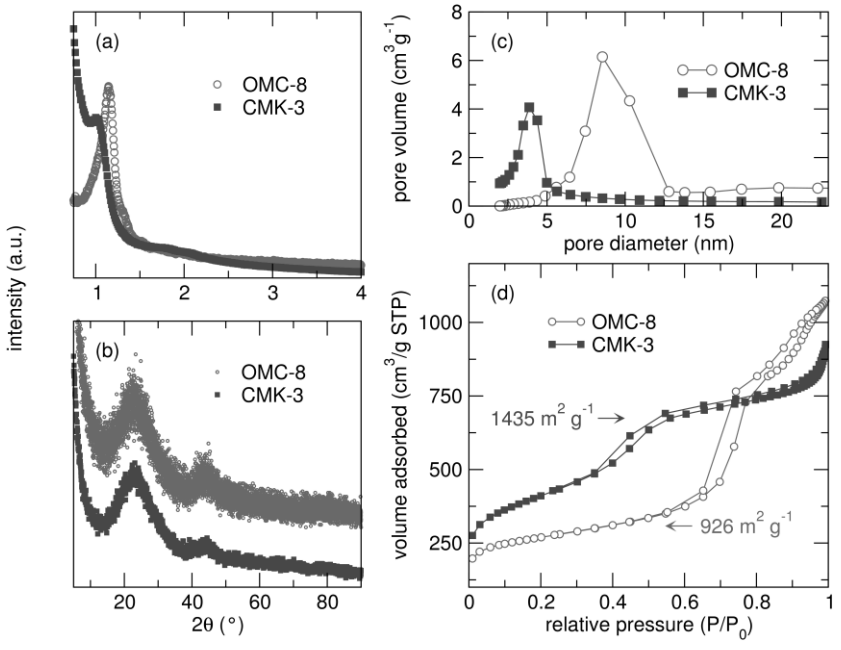

Figure S1. Characterization of hexagonal mesoporous carbon (CMK-3) and cubic mesoporous carbon (OMC-8) sulfur supports. Characterization of these materials includes (a) small angle X-ray diffraction showing the long range ordering of the pore structure, (b) X-ray diffraction showing two broad peaks indicative of amorphous carbon, (c) pore size distributions as determined by the BJH algorithm on the N_2 adsorption isotherm and (d) N_2 adsorption isotherms showing mesoporosity. The Brunauer-Emmett-Teller surface areas are indicated in (d).

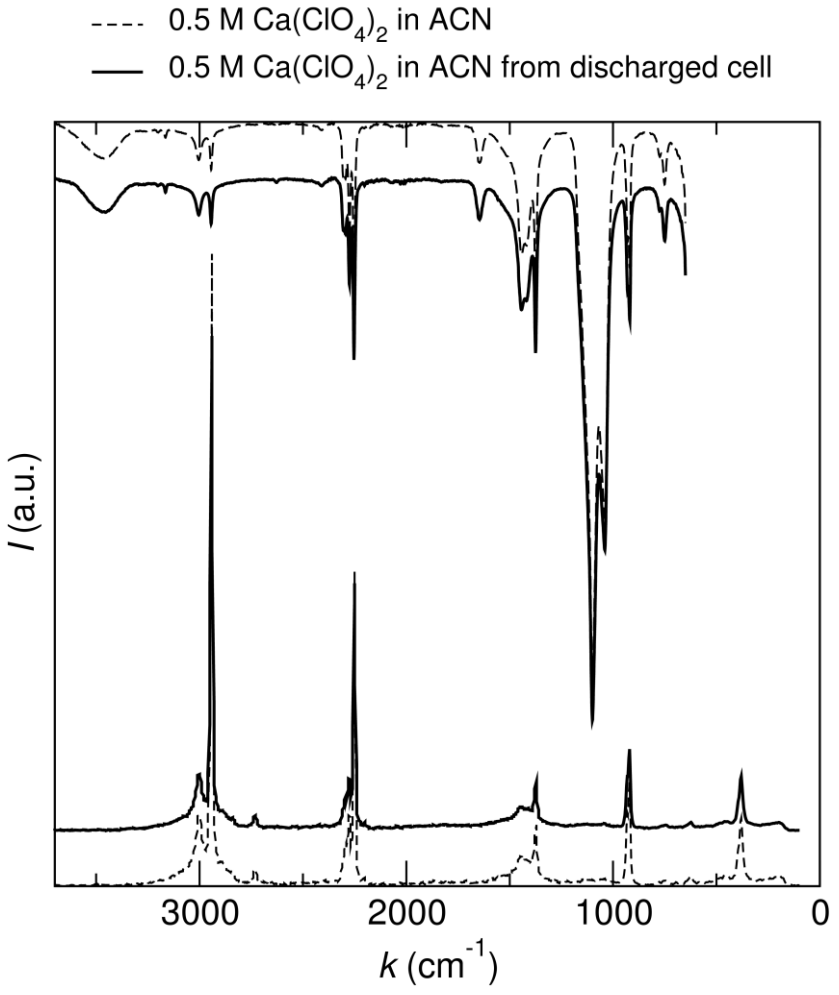

Figure S2. Raman spectra (bottom traces) and Fourier-Transform Infrared Spectroscopy (top traces) of electrolyte before cycling (dashed black) and after discharging to 0V (solid red) at −15 °C. There are no additional Raman transitions or FTIR stretches visible indicating that the electrolyte does not contain any contaminants FTIR or Raman active.

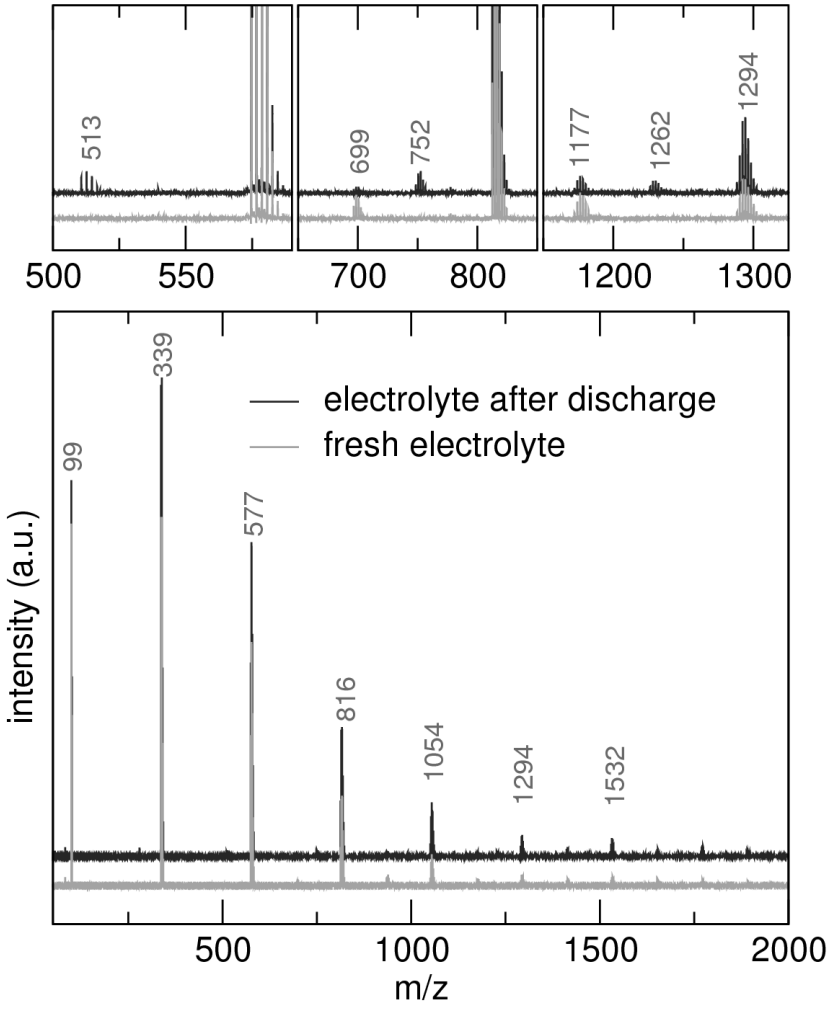

Figure S3. Electrospray Mass Spectrometry of 0.5 M $Ca(ClO_4)_2$ in ACN before and after discharge. The strong signals (99 m/z, 339 m/z, 577 m/z, etc.) are due to ClO_4^-, $Ca(ClO_4)_3^-$, etc.; however, the weaker signals at 752 m/z, 1262 m/z, etc. in the discharged electrolyte are due to clustering with ClO_3^-.