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Engineering & Scientific Consulting

## Adam P. Cohn, Ph.D.

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### Professional Profile

Dr. Cohn specializes in failure analysis, material characterization, material synthesis, and electrochemical testing. His expertise includes battery design and testing, with experience working on a range of current and emerging battery chemistries.

Dr. Cohn has experience characterizing materials using Raman spectroscopy, X-ray diffraction (XRD), scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), and UV-visible spectroscopy (UV-Vis). He also has experience with a range of synthesis and deposition techniques, including sol-gel synthesis, wet-chemical synthesis, hydrothermal synthesis, solid-state synthesis, aluminum anodization, chemical vapor deposition (CVD), and atomic layer deposition (ALD).

As a National Science Foundation Graduate Research Fellow at Vanderbilt University, Dr. Cohn's research was focused on the design, development and characterization of new battery chemistries, including sodium-ion and sodium metal systems for low-cost stationary energy storage. In addition, Dr. Cohn worked on the development of low-power color display technology utilizing electrochemical actuation, as well as the development of a solar-powered supercapacitor for mitigating the problem of renewable power intermittency.

### Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Vanderbilt University, 2018

B.S., Physics, Tufts University, 2011

NSF Graduate Research Fellowship, National Science Foundation, 2015-2018

### Prior Experience

Energy Analyst, Pace Energy and Climate Center, 2011-2013

### Patents

U.S. Application No. 16/135,697: Electrochemically Actuated Optical Modulator. (Valentine JG, Coppens Z, Pint CL, Cohn AP) patent pending.

International Application No. PCT/US2017/059781: Electrochemical Cells and Methods of Making and Using Thereof. (Cohn AP, Pint CL) patent pending.

## Publications

Muralidharan N, Brock C, Cohn AP, Schauben D, Carter R, Oakes L, Walker DG, Pint CL. Tunable mechanochemistry of lithium battery electrodes. *ACS Nano* 2017; 11:6243-6251.

Cohn AP, Muralidharan N, Carter R, Share K, Pint CL. An anode-free sodium battery through in-situ plating of sodium metal. *Nano Letters* 2017; 17:1296-1301.

Carter R, Oakes L, Douglas A, Muralidharan N, Cohn AP, Pint CL. A Sugar-Derived Room-Temperature Sodium Sulfur Battery with Long Term Cycling Stability. *Nano Letters* 2017; 17:1863-1869.

Carter R, Oakes L, Muralidharan N, Cohn AP, Douglas A, Pint CL. Polysulfide anchoring mechanism revealed by atomic layer deposition of V<sub>2</sub>O<sub>5</sub> and sulfur filled carbon nanotubes for lithium-sulfur batteries. *ACS Applied Materials and Interfaces* 2017; 9:7185-7192.

Muralidharan N, Carter R, Oakes L, Cohn AP, Pint CL. Strain Engineering to Modify the Electrochemistry of Energy Storage Electrodes. *Scientific Reports* 2016; 6:27542.

Share K, Cohn AP, Carter R, Rodgers B, Pint CL. Role of nitrogen doped graphene for improved high capacity potassium ion battery anodes. *ACS Nano* 2016; 10:9738-9744.

Cohn AP, Muralidharan N, Carter R, Share K, Oakes L, Pint CL. Durable potassium ion battery electrodes from high-rate cointercalation into graphitic carbons. *Journal of Materials Chemistry A* 2016; 4:14954-14959.

Share K, Cohn AP, Carter R, Pint CL. Mechanism of Electrochemical Potassium Ion Intercalation Staging in Few Layered Graphene from In-Situ Raman Spectroscopy. *Nanoscale* 2016; 8:16435-16439.

Cohn AP, Share K, Carter R, Oakes L, Pint CL. Ultrafast solvent-assisted sodium ion intercalation into highly crystalline few-layered graphene. *Nano Letters* 2016; 16:543-548.

Cohn AP, Erwin WR, Share K, Oakes L, Westover A, Carter R, Bardhan R, Pint CL. All silicon electrode photo-capacitor for integrated energy storage and conversion. *Nano Letters* 2015; 15:2727-2731, 2015.

Cohn AP, Oakes L, Carter R, S. Chatterjee, Westover A, Share K, Pint CL. Assessing the improved performance of freestanding, flexible graphene and carbon nanotube hybrid foams for lithium-ion battery anodes. *Nanoscale* 2014; 6:4669-4675.

## Presentations

Cohn AP, Pint CL. Developing an Anode-Free Sodium Battery. Oral presentation, Materials Research Society Fall Meeting, Boston, MA, 2016.

Cohn AP and Pint CL. Cointercalation for Alternative Ion Storage. Oral presentation Materials Research Society Fall Meeting, Boston, MA, 2016.

Cohn AP, Share K, Carter R, Oakes L, and Pint CL. Ultrafast Sodium Ion Cointercalation in Few-Layered Graphene. Poster presentation, Gordon Research Conference on Batteries, Ventura, CA, 2016.