

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Roll-to-Roll Production of Spray Coated N-doped Carbon Nanotube Electrodes for Supercapacitors¹ MEHMET KARAKAYA, JINGYI ZHU, ACHYUT RAGHAVENDRA, RAMAKRISHNA PODILA, Clemson University, SAMUEL PARLER, JAMES KAPLAN, Cornell Dubilier Electronics, Inc., APPARAO RAO, Clemson University, CORNELL DUBILIER ELECTRONICS, INC. COLLABORATION — Although nanocarbons are being increasingly used in energy storage, there has been a lack of inexpensive, continuous and scalable synthesis methods. Here we present a scalable roll-to-roll spray coating process for synthesizing supercapacitors from randomly oriented multi-walled carbon nanotubes electrodes on Al foils, which yield high power and energy densities ($\sim 700 \text{ mW/cm}^3$ and 1 mWh/cm^3) and cycle stability (>10000 cycles) on par with Li-ion thin film batteries. Our cost analysis shows that the R2R spray coating process can produce supercapacitors with 10 times the energy density of conventional activated carbon devices at $\sim 17\%$ lower cost.

¹NSF CMMI SNM Award #1246800

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Date submitted: 14 Nov 2014

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