

## **SWNT/Lithium-ion Batteries**

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This research investigated the capacity and cycle-ability of anodes comprised of Single-Wall Carbon Nanotubes (SWNTs) in a poly vinylidene fluoride (PVdF) polymer binder. The SWNTs used in this study were synthesized by laser vaporization. Higher purity SWNTs were obtained by refluxing the laser vaporized soot in acid followed by a thermal oxidation in air. The purity of the SWNT sample was determined using thermal gravimetric analysis, and qualitatively assessed using scanning electron microscopy. Coin-cell batteries were assembled using a SWNT anode opposite a lithium-metal reference electrode, separated by a celgard® spacer. The electrolyte used was a 1M LiPF<sub>6</sub> in (1:1 v/v) ethylene carbonate/dimethyl carbonate solution. The capacity and cycle-ability of the SWNT anodes were measured galvanostatically on an Arbin test system with a current density of 10  $\mu\text{A}/\text{cm}^2$  on the initial intercalation/de-intercalation cycle, followed by 20 cycles at a current density of 50  $\mu\text{A}/\text{cm}^2$ . For comparison, graphite/PVdF anodes were prepared and tested under the same conditions. The SWNT anodes show a slight increase in specific capacity (mAh/g) and a significant improvement in cycle-ability when compared to the graphite anodes.