



Nippon Chemi-Con Corporation
March 26, 2010

Nippon Chemi-Con announces: The advanced new technology Nano-hybrid Capacitor

Nippon Chemi-Con Corporation will start the development of mass production technology for “Nano-hybrid Capacitor”, a capacitor which has been developed in collaboration with Tokyo University of Agriculture and Technology (TUAT). The company aims to launch a framework to ship samples by April 2011.

Nippon Chemi-Con has been developing next-generation capacitors in collaboration with the Naoi Laboratory at the graduate school of TUAT (Professor Katsuhiko Naoi) and K & W (a venture company spun off from the university). The company established the “Capacitor Technology Course”, a course which focuses on capacitors at TUAT in 2006, and has been sponsoring the course since then. This business-academia alliance achieved development of the “Nano-hybrid Capacitor” in March, 2009 and Nippon Chemi-Con now focuses on commercializing the capacitor.

The Nano-hybrid Capacitor uses completely new electrode materials comprising nanocrystalline lithium titanate grafted on carbon nanofiber for its negative electrode. The capacitor has up to 3 times higher energy density than that of conventional electric double layer capacitors (EDLC), while maintaining the power density of EDLC.

When compared with lithium-ion capacitors, the Nano-hybrid Capacitor has achieved 1.5 times higher power density while featuring the same energy density of lithium-ion capacitors. The capacitor has low temperature advantages over lithium-ion capacitors, showing good performance in the cold climate temperature range of -20 deg C to -40 deg C.

In regard to reliability, the capacitor ensures high safety as its intercalation potential on the negative electrode is 1.55V which is higher than that of lithium-ion capacitors (about 0V), preventing decomposition of electrolyte and electrocrystallization of lithium metal. In addition, the Nano-hybrid Capacitor offers productivity superiority as it requires no Li pre-doping process in assembling the cells.

For commercialization, Nippon Chemi-Con plans to develop 2 types of capacitors. One is the “high-energy type”, with energy density increased by 3 times compared to EDLC, and the other is the “high-power type”, with energy density doubled over the EDLC, while maintaining the same power density of EDLC. Rated voltage of both types will be 2.8V, and their configurations will be cylindrical with winding structure for the purpose of ensuring high durability.

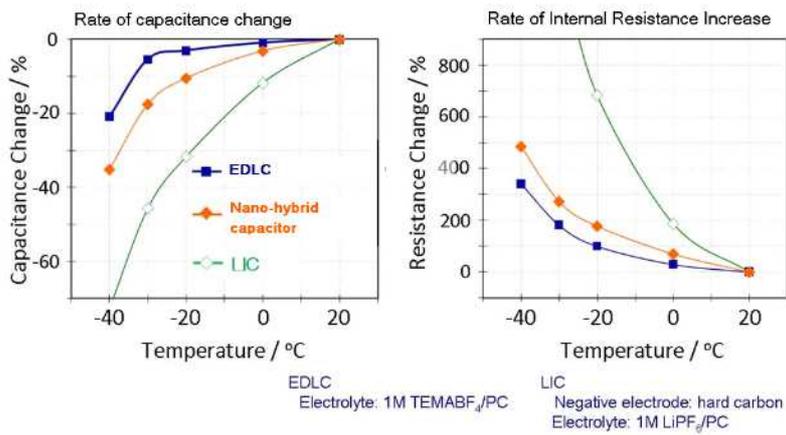
The company will aim toward establishing mass production technology to start sample shipments in April 2011. The company plans to consider larger production depending on the market demand.

Nanocrystalline lithium titanate ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) mounted on carbon fiber both internally and externally



(High-resolution transmission electron microscope image)

Low Temperature Properties of Nano-Hybrid Capacitor



Location of Nano-Hybrid Capacitor (target)

