

Development of High Performance Micro Tubular SOFCs

Micro tubular SOFCs of ceria based electrolyte with 0.8-1.6 mm diameter have been fabricated using an advanced ceramic processing technology. SOFC stacks of high volumetric power density at 500 - 600 °C can be built with the micro tubes. The single tubular SOFC showed cell performance of 1W/cm² at 570°C with H₂ fuel. The tubular SOFCs will be applied to a compact power device which can endure repeated rapid changes of electrical load and operating temperatures.

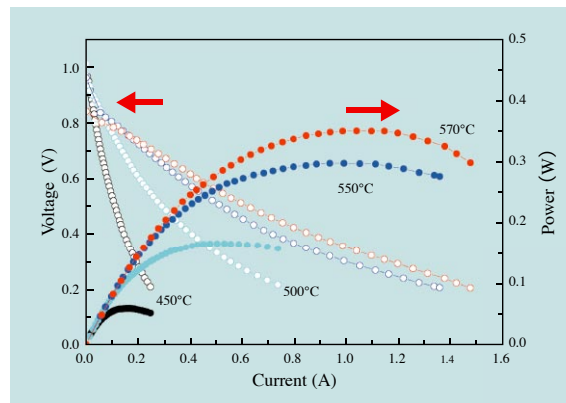


Figure : Cell performance of the single micro tubular SOFC -- 1.6 mm diam. 1 cm length (0.7 mm cathode length)

Highly Stabilized β -carotene in Single-walled Carbon Nanotubes

An effective stabilizing method for organic molecules is a bottleneck preventing their industrial application. For example, β -carotene has the following remarkable features; ultrafast optical response, third-order optical nonlinearity, and so on. However, it has not been used as photonic-devices because it easily degrades by oxidation and isomerization. We have succeeded in encapsulating β -carotene inside of single wall carbon nanotubes. The stability of β -carotene is highly improved by the encapsulation.

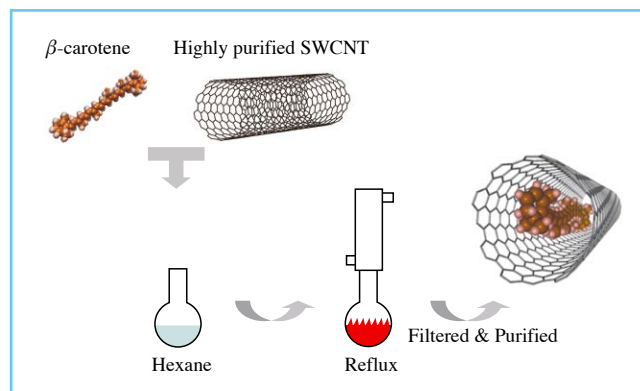


Figure : Encapsulation procedure of β -carotene in SWCNT.

Toshio Suzuki
Advanced Manufacturing
Research Institute
E-mail:
toshio.suzuki@aist.go.jp

AIST TODAY Vol.6, No.5 (2006)
p.24-25

Kazuhiro Yanagi
Nanotechnology
Research Institute
E-mail:
k-yanagi@aist.go.jp

AIST TODAY Vol.6, No.5 (2006)
p.26-27