

Thermal Diffusivity Measurements of a Supergrowth Carbon Nanotube Using the Laser Flash Method

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For the first time, we have measured the thermal diffusivity of a supergrowth carbon nanotube using the laser flash method. The "supergrowth carbon nanotubes" are pure single-walled carbon nanotubes grown to millimeter-scale length, synthesized by water-assisted CVD.

We have developed a standard thermal diffusivity measurement system, which is calibrated to SI units, and the uncertainty of which was evaluated based on: *Guide to the Expression of Uncertainty in Measurement* published by ISO. The reliability of the thermal diffusivity measurements was checked using a reference material produced by the NMIJ (National Metrology Institute of Japan).

Using this system, we have measured the thermal diffusivity of supergrowth carbon nanotube samples. The measured samples are squares, with either 5 mm or 10 mm sides, and thicknesses of about 1 mm. The measured thermal diffusivities are from 4.7×10^{-5} to 7.7×10^{-5} m²/s, with about 15 % expanded uncertainty and a coverage factor k=2. These values are close to those of isotropic graphite.