

## Purification Methods for Single-Walled Carbon Nanotubes

High-purity, long SWCNTs with specific chirality

### Overview

Single-walled carbon nanotubes (SWCNTs) are regarded as promising materials for next-generation electronics owing to their unique optical, electronic, and mechanical properties. Conventional synthesis methods such as laser ablation and arc discharge create SWCNTs with a broad mixture of chiralities, resulting in inconsistent device performance. Polymer wrapping and density gradient ultracentrifugation (DGU) are widely used for chirality separation, but polymer wrapping is limited to certain chiralities and DGU tends to shorten nanotube length, increasing resistance in electronic devices. We have developed a new dispersion and purification method that enables efficient separation of a wide variety of SWCNT chiralities—including enantiomers—while preserving tube length. The resulting high-purity, long SWCNTs allow the realization of advanced devices with high speed and sensitivity, expanding the possibilities for practical applications in electronics and sensing technologies.

### Product Application

- SWCNTs purification ; semiconductor devices using SWCNTs

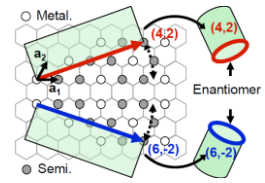
### IP Data

IP No. : Not published  
Inventors : YOMOGIDA Yohei, NAGASHIMA Kazuki , AN Zimeng  
Admin No. : HK25-002

## Features · Outstandings

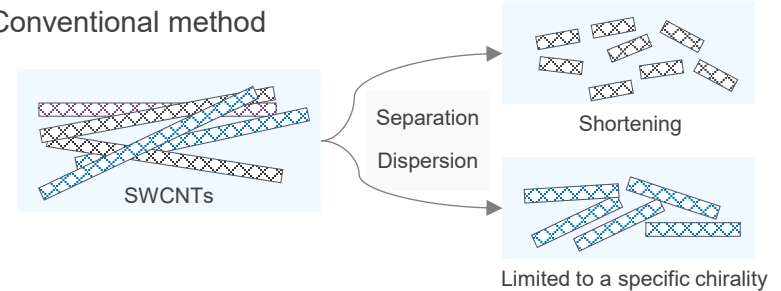
### About chirality

- SWCNTs are graphene sheets rolled into tubes
- The way graphene is rolled called chirality (n,m)
- The properties of SWCNTs vary depending on their chirality



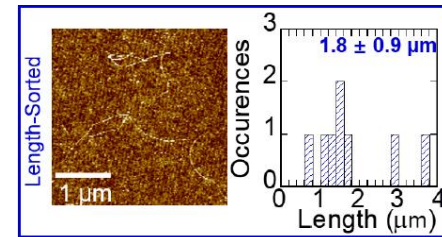
### Challenges in SWCNTs purification

Conventional method



- SWCNTs shortening  $\Rightarrow$  resistivity increase
- Limited to a specific chirality  $\Rightarrow$  restricted to specific application

### Partial effects of the invention



- Achievement of long SWCNTs (average 1.8μm)
- Interested companies are welcome to contact us.

\* This invention includes unpublished details; please contact us for more information.

### Contact

Tohoku Techno Arch Co., Ltd.

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