



## Technical Data Sheet

# ACS Material Purified Carboxylic Multi-Walled Carbon Nanotubes (MWNTs-COOH, 10-20 nm)

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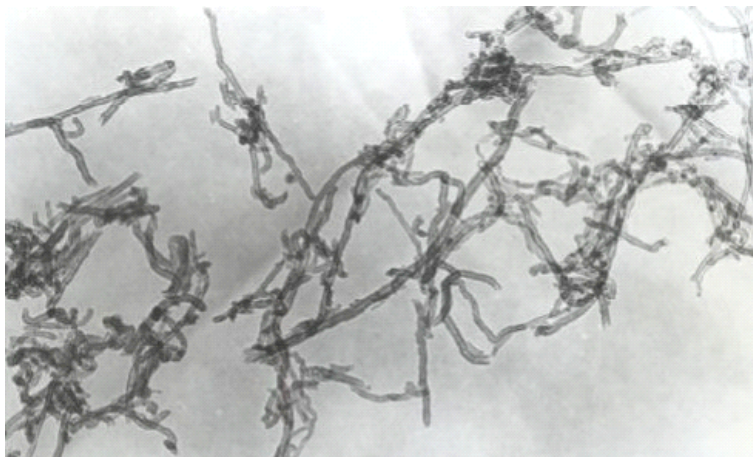
Revision: 121817

## 1. Preparation Method

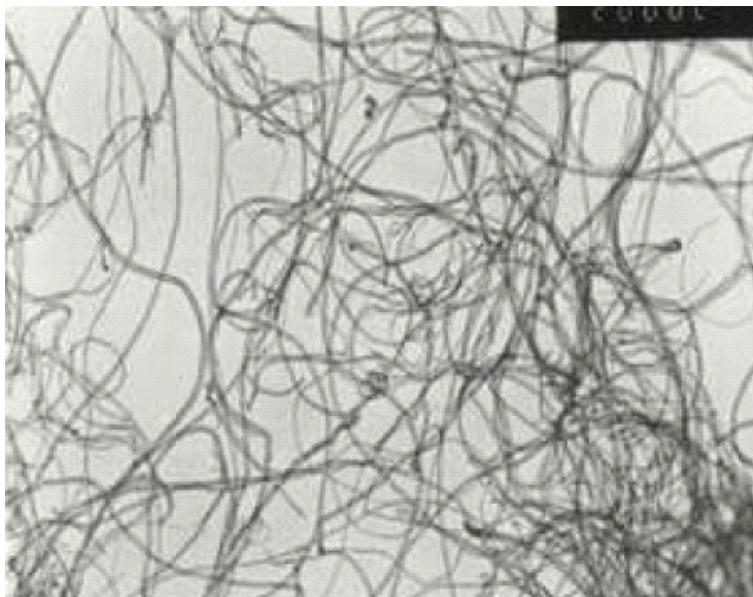
Chemical Vapor Deposition (CVD) Method

## 2. Characterizations

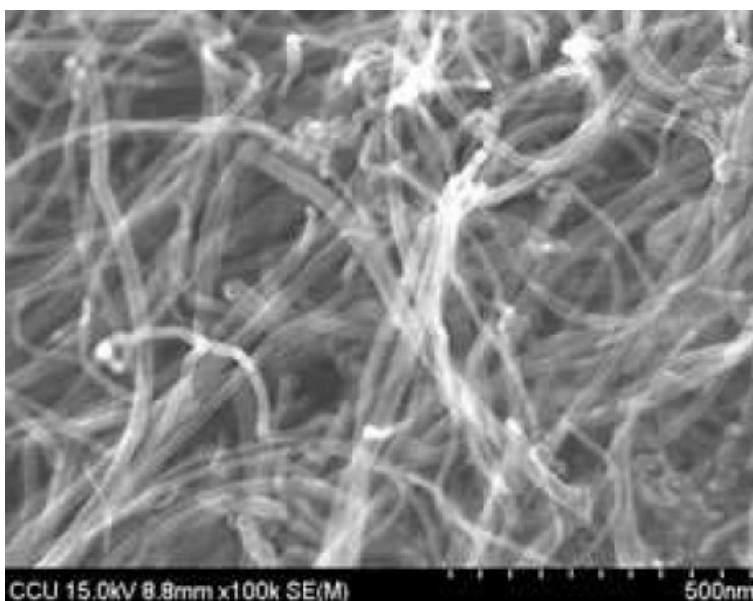
<b>Purity:</b>	>95%
<b>-COOH Content:</b>	2.00 wt.%
<b>Color:</b>	Black
<b>Outer Diameter:</b>	10-20 nm
<b>Inner Diameter:</b>	5-10 nm
<b>Length:</b>	0.5-2 $\mu\text{m}$ 10-30 $\mu\text{m}$
<b>SSA:</b>	>200 $\text{m}^2/\text{g}$
<b>Tap Density:</b>	0.22 $\text{g}/\text{cm}^3$
<b>True Density:</b>	$\sim 2.1 \text{ g}/\text{cm}^3$
<b>EC:</b>	>100 S/cm



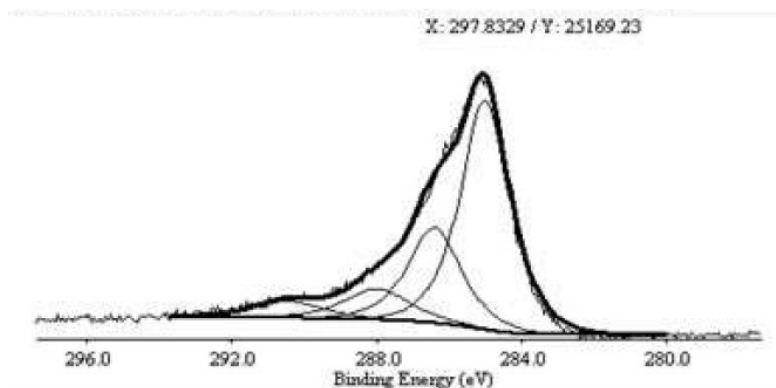
TEM Image of ACS Material Purified MWNTs-COOH (Length = 0.5-2  $\mu\text{m}$ )



TEM Image of ACS Material Purified MWNTs-COOH (Length = 10-30  $\mu\text{m}$ )



SEM Image of ACS Material Purified MWNTs-COOH (Length = 10-30  $\mu\text{m}$ )



XPS Analysis of ACS Material Purified MWNTs-COOH (Length = 10-30  $\mu\text{m}$ )

Components	Contents (%)
C	99.8
Cl	0.2

EDS Analysis of ACS Material Purified MWNTs-COOH (Length = 10-30  $\mu\text{m}$ )

### 3. Application Fields

Catalysts, additives in polymers, nanoelectrodes, drug delivery, sensors, electromagnetic-wave absorption and shielding, electron field emitters for cathode ray lighting elements, flat panel display, gas-discharge tubes in telecom networks, energy conversion, lithium-battery anodes, hydrogen storage, supercapacitors, nanotube composites (by filling or coating), nanoprobes for STM, AFM, and EFM tips, nanolithography, reinforcements in composites, *etc.*

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