

# カーボンナノチューブ (CNT)

## Carbon nanotubes

### 特徴 | Characteristics

- 大面積基板からミリオーダーカーボンナノチューブ(CNT)が直接垂直成長  
CNT in millimeter height grows vertically direct on the large area substrate
- アスペクト比が高い (20万倍)  
High aspect ratio (200,000 times)
- 金属不純物が少ない (ppmオーダー)  
Less metallic impurities
- 軽い (層数が少ない:3~7層)  
Lightweight (A small number of walls : 3 walls~7 walls)

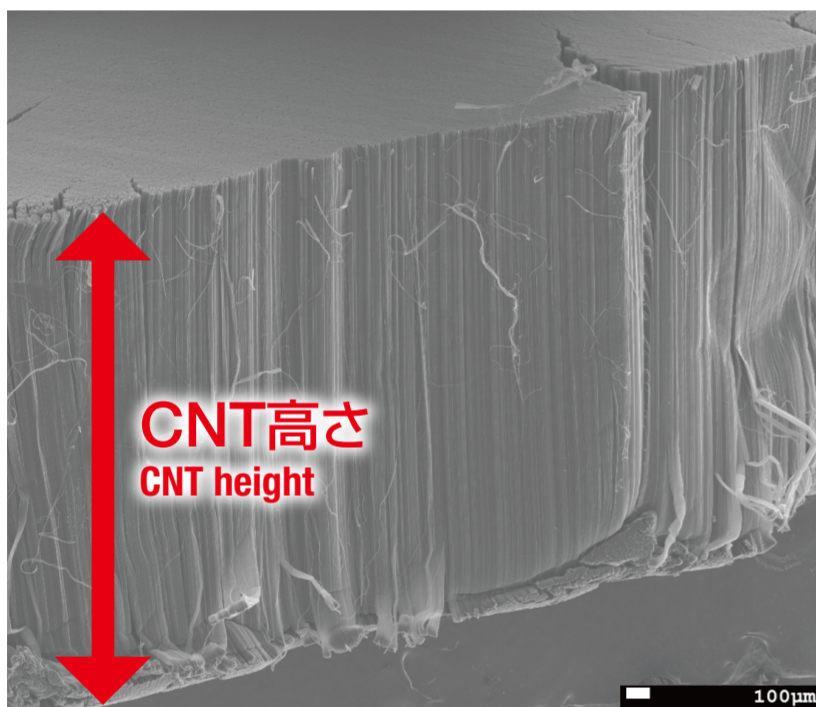
基板外観  
Substrate appearance



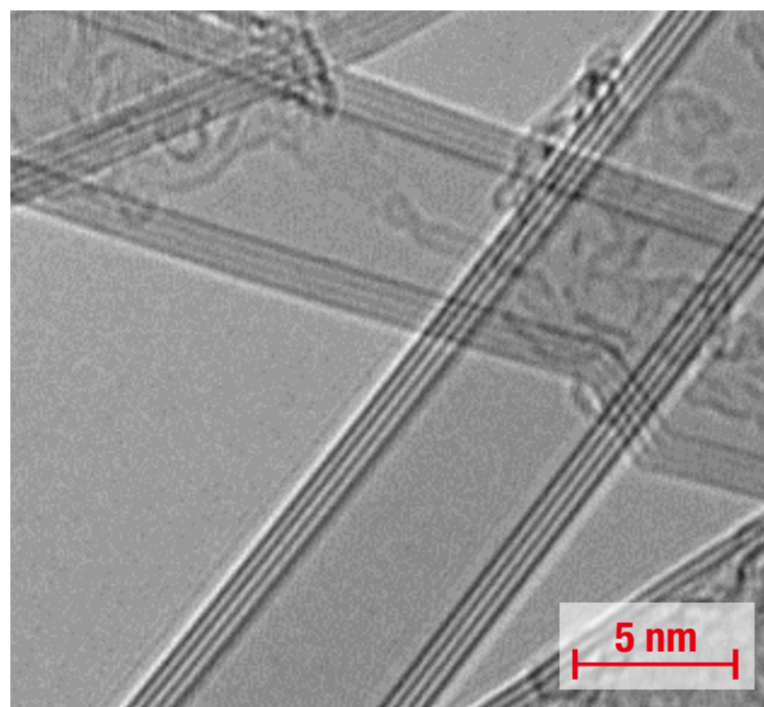
### 代表物性値 | Representative property value

特性 Properties	代表値 Representative Value
CNT高さ CNT height	~2 mm
CNT直径 CNT outer diameter	5~12 nm
比表面積 Specific surface area	225~390 m <sup>2</sup> /g
層数 Wall number	3層~7層 3~7 walls
金属不純物 Metal impurities	250 ppm以下 Under 250 ppm
G/D比 G/D ratio	0.8 以上 0.8 or more

### SEM像 | SEM image

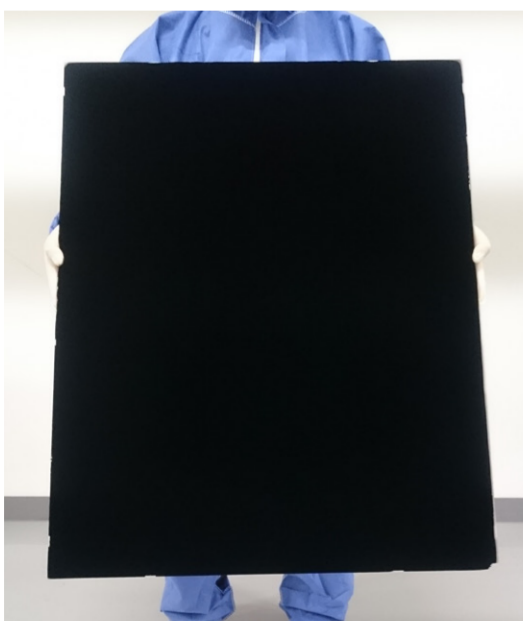


### TEM像 | TEM image

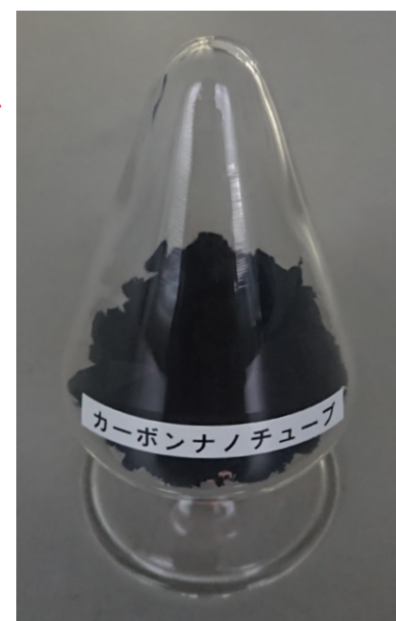


### アプリケーション化に向けた加工技術(例) | Processing technology for application development

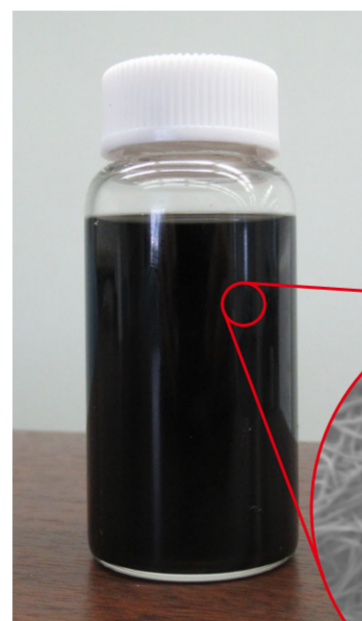
● 基板外観  
Substrate appearance



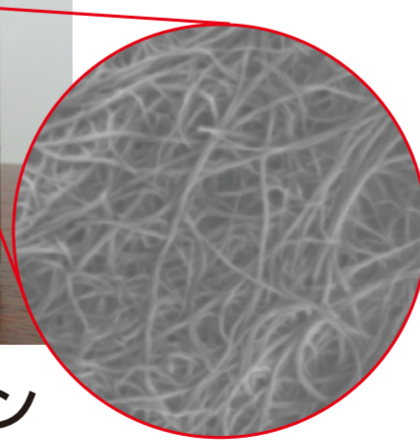
● CNT  
Carbon nanotubes



● 分散液  
Dispersion



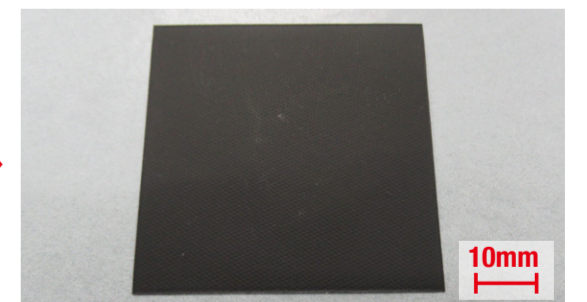
● SEM像  
SEM image



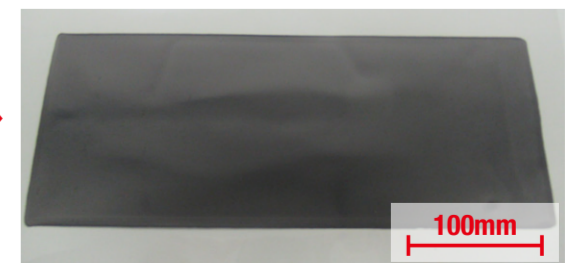
● CNT複合ゴム  
CNT composite rubber



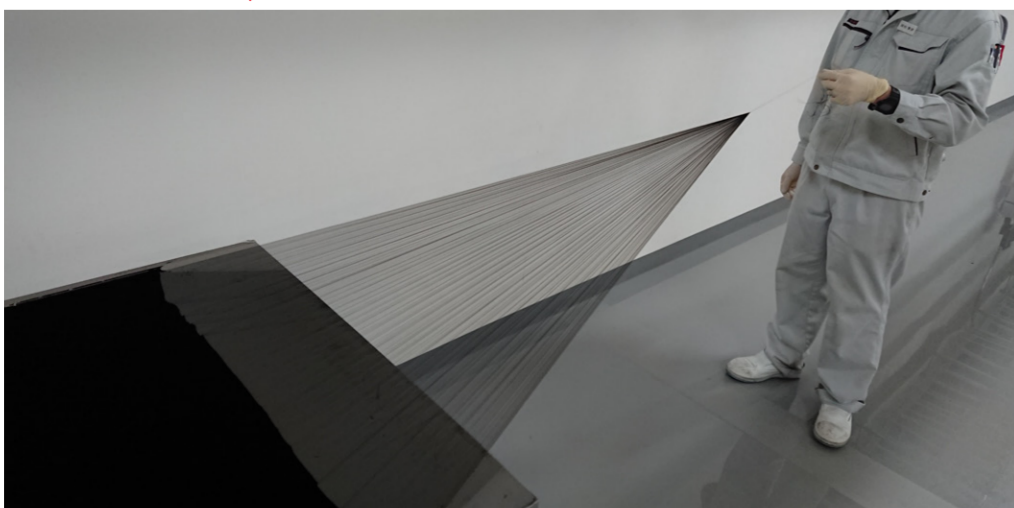
● CNT不織布  
CNT non-woven fabric



● CNTフィルム  
CNT film



● 引出可能なCNT  
Drawable CNT



● CNTヤーン  
CNT yarn

