

# Aqueous Dispersion of Carbon Nanotubes by Self-aggregating Peptides

Dukeun Kim, Toshiki Sawada, Takeshi Serizawa (Tokyo Institute of Technology)

Carbon nanotubes (CNTs) have remarkable mechanical and chemical properties, however, their applications are hindered due to the intrinsically low solubility and self-aggregating properties in water. In this presentation, we describe disentanglement and dispersion of CNTs with easily aggregating peptides (Figure 1). Because aggregating peptides are difficult to handle in aqueous phase, development of a new process is required. Our new method utilizes the peptides before aggregation. Thereby, according to the method, high dispersion capabilities of the peptide were demonstrated by absorption spectra (Figure 2) and disentangled CNTs also confirmed from AFM observation (Figure 3). CNTs can be individually isolated and stably dispersed in water through  $\pi$ - $\pi$  interactions with the aggregating peptides.

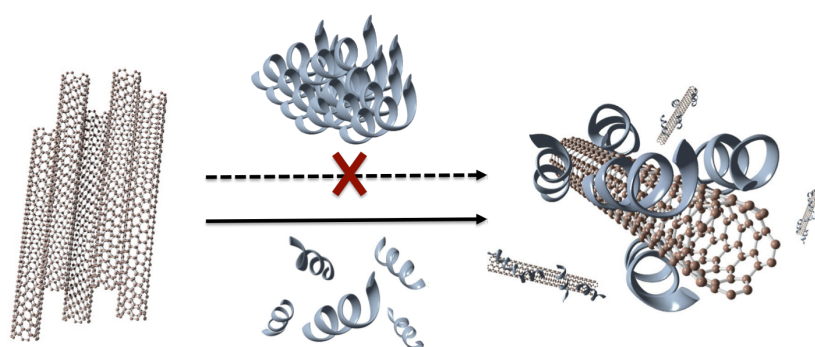


Figure 1. Aqueous dispersion of CNTs via peptide wrapping

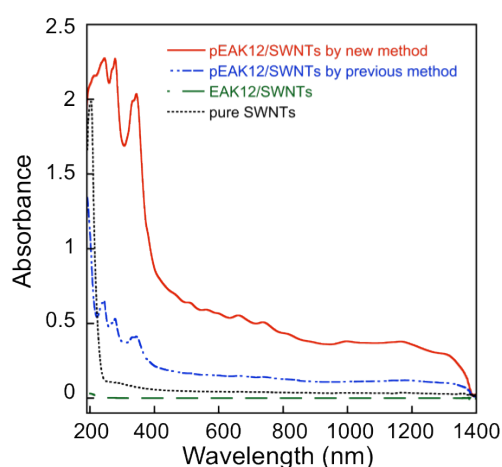


Figure 2. UV/Vis spectra of pEAK12 peptide-wrapped CNTs made by new method and previous method, comparing EAK12/CNTs and pure SWNTs

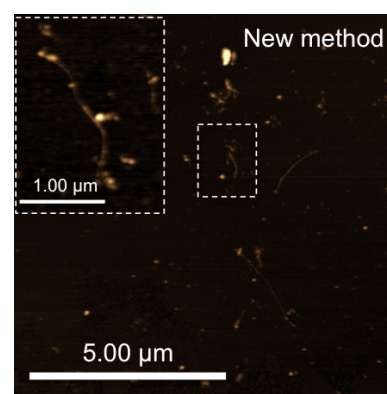


Figure 3. AFM image of pEAK12/CNTs nanohybrids by new method on the mica surface