

Polymer Wrapping of Single Wall Carbon Nanotubes

A method for helically wrapping carbon nanotubes with polymer to increase processing strength while preserving desirable characteristics of nanotubes

Georgia Tech inventors have developed a method to helically wrap single-wall carbon nanotubes (SWNTs) with polymethyl-methacrylate (PMMA). This wrapping provides a thin uniform layer of PMMA on the surface of the nanotubes and prevents their bundling. A wide range of processing conditions can be used to helically wrap PMMA. Once a SWNT is wrapped, its electrical and mechanical properties can be preserved through material processing.

Summary Bullets

- **Scalable** – process can be easily scaled up to enable commercial applications
- **Flexible** – PMMA wrap can be applied through a variety of processing conditions
- **Removable** – helical wrap allows PMMA to be removed without damaging nanotube

Solution Advantages

- **Scalable** – process can be easily scaled up to enable commercial applications
- **Flexible** – PMMA wrap can be applied through a variety of processing conditions
- **Removable** – helical wrap allows PMMA to be removed without damaging nanotube
- **Strong** – more optimal carbon nanotube fiber strength
- **Reliable** – preserves mechanical and electrical properties of SWNT

Potential Commercial Applications

- Carbon Nanotube fibers
- Electronic Materials
- Biomedical Engineering Applications

Background and More Information

Carbon nanotubes are one of the strongest known materials and are highly sought after in a variety of applications for their strength and electronic properties. When assembled into fibers, however, their collective

strength can be decreased by random orientations and discontinuous lengths, known as bundling. To prevent this, carbon nanotubes are typically wrapped with polymer. Helically wrapped polymer has the advantage of being able to be removed without damaging the carbon nanotube.

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Publications

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Images

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