

Little Technology Makes Big Gains

Processing bulk carbon nanotubes is now easier and more efficient thanks to the discovery of new operational protocols.

One billionth of a meter? What good can come of something so small? The term nanotechnology involves any technology that pertains to small matter—approximately 100 nm or smaller to be exact. The word can also be used to refer to the application of it: the study and building of devices on the nanometer scale, meaning built from single atoms and molecules. (To put a nanometer into a more illustrative context, the diameter of a DNA double helix is 2 nm.) Yet no matter how small a nanoparticle may be, enough of them may add up to make a big impact within the processing industry.

For example, Microfluidics, a wholly owned subsidiary of MFIC Corp., recently announced that it has discovered a methodology to more effectively and efficiently process bulk carbon nanotubes. This includes not only processing, but also deagglomerating and facilitating the purification and stabilization of the nanotubes, so they can be used in an optimal manner, thus achieving enhanced functionality and performance.

The company has identified and demonstrated several specific operational protocols utilizing its Microfluidizer® processor systems to prepare these bulk nanotubes for their ultimate specific uses. These applications capitalize on the unique mechanical, electrical and thermal properties of carbon nanotubes. Furthermore, the process requires the dispersion of the nanotubes in liquid media, in addition to independent length reduction of the tubes.

Carbon nanotubes are noted for their tubular shape, extremely small diameter with respect to length, and exceptional physical, mechanical and electrical properties. When prepared in diameters in the 10- to 50-nm range, the unique characteristics of strength, conductivity and quantum behavior become highly desirable and are thus incorporated into a multitude of commercial products.

Microfluidizer® processors are ideal for conditioning carbon nanotubes (and nanomaterials in general) for applications that include high tensile strength polymers, fabric treatments, lubricants, medical therapeutics, computer memory and chips, electronic devices, photovoltaic cell components and more.

One of the obstacles facing the implementation of nanotechnology has been practical manufacturing of nanotechnologic products in great enough quantities. To address that issue, Nanocomp Technologies has figured out a way to produce 3- by 6-ft. sheets of carbon nanotube material—the largest cohesive sheets of this type ever manufactured, according to the company. Nanocomp believes short nanotubes have limited industrial use because they are difficult to incorporate into existing

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manufacturing processes, and do not possess the high-performance properties of long carbon nanotubes.

Microfluidics supplies fluid-processing equipment and reaction technology, enabling the manufacture of nanomaterials and nanoscale products. More information is available by contacting the company at 800.370.5452 or mixinginfo@mfics.com, or by visiting www.microfluidicscorp.com. More information is also available by contacting Nanocomp Technologies at info@nanocomptech.com or by visiting www.nanocomptech.com.

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