
TIP Project Brief – 090021/10H001

Manufacturing

Production of Low-Cost, High-Quality Metallic and Semiconducting Single Wall Carbon Nanotube Inks

Develop technologies for the cost-effective production of high-purity, high-quality, metallic and semiconducting carbon nanotube 'inks' to enable commercial production of a wide variety of high-performing electronic devices for energy, flexible electronic and sensor applications.

Sponsor: Brewer Science, Inc.

Rolla, MO

- Project Performance Period: 2/1/2010 - 1/31/2013
- Total project (est.): \$13,910 K
- Requested TIP funds: \$6,527 K

Brewer Science, in conjunction with SouthWest NanoTechnologies (SWeNT), is developing a set of technologies for the cost-effective, commercial production of high-purity, high-quality single-walled carbon nanotube (SWCNT) ink solutions. After many years of research, carbon nanotubes have emerged as one of the most promising classes of 'nanomaterials'—advanced materials that exhibit unique, functional properties in nanoscale structures. In the case of single-walled carbon nanotubes, the long, cylindrical carbon macromolecules possess unique physical, electrical, optical and mechanical properties. These properties make them suitable for a wide array of applications including high-performance optical devices, photovoltaic cells, batteries, supercapacitors, lighting products, flexible electronic devices, sensors and high-performing specialty materials (such as high mechanical strength nanocomposites). However, a major obstacle to commercializing products from these carbon nanotube materials is the lack of affordable high-purity, high-quality single-walled carbon nanotubes. Conventional methods produce carbon nanotubes that are not readily suitable for enabling these high-performance applications. Brewer Science, which has a long history in commercializing high-performance materials for the semiconductor industry, has developed processes to purify, separate, disperse and manufacture metallic and semiconducting carbon nanotube ink solutions. Applying these processes to the raw carbon nanotubes manufactured by SWeNT yields a new generation of commercial-scale single-walled carbon nanotube inks that can be applied with a variety of deposition techniques. These conductive and semiconducting carbon nanotube inks will enable domestic leadership in a wide variety of applications, including photovoltaics, supercapacitors, solid-state lighting, energy storage, printed electronics and sensors. The demand shown for such a solution makes the work from this project valuable to the successful production, separation, purification, dispersion and scale-up technologies that are cost-effective and required to address the needs satisfied by these high-performance carbon nanotube inks.

For project information:

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Active Project Members

- Brewer Science, Inc. (Rolla, MO)
[Original, Active JV Member]
- Southwest Nanotechnologies, Inc. (Norman, OK)
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