



Methods and Novel Spectrophotometer for Achieving Uniform Dispersion of Carbon Nanotubes, Graphene and Nanocellulose

WiSys: T08014US

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The WiSys Technology Foundation is seeking commercial partners interested in commercializing the instrument and applying the methods to the manufacture of graphene and carbon nanotube bulk materials, composites and other products.

Overview

Many industries including electronics, automotive, aerospace, telecommunications and healthcare have been exploring the use of superior super-nanomaterials such as carbon nanotubes and graphene. Although forecasts for these material markets currently exceed 250 million for carbon nanotubes alone, actual use of the materials has proven difficult due to undesirable clumping properties. Current methods to address these issues result in an expensive manufacturing process with potential for impurities in the end product and possible disruption of the superior qualities. Achieving a cost-effective uniform dispersion without impurities is ideal and will allow manufacturers to take advantage of the superior electrical, mechanical, and structural properties of carbon nanotubes, graphene and nanocellulose, among others.

The Invention

Researchers at UW-Platteville have developed enabling technologies that address the purification and dispersion problems inherent when processing graphene, carbon nanotubes and other nanomaterials. A sensitive photon counting static light scattering (SLS) spectrophotometer was built to collect data for calculating various thermodynamic parameters of dilute samples. The data is used to identify the existence of a solvent resonance whose local extreme identifies the intrinsic property of an ideal solvent (for a given solute). The intrinsic property identified by the solvent resonance can be employed to inform a search for a solvent having the best match to this intrinsic property.

Applications

- Reinforcement of composites
- Conductive plastics
- Energy storage
- Electronic flat screens
- Sensors
- Ink-jet Printing

Key Benefits

- Eliminates clumping of carbon nanotubes and graphene sheets
- Superior to other prior solvation methods of carbon nanotubes because no chemical modification is required

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