Aluminum-Single-Wall Carbon Nanotubes

ID# 2012-4010



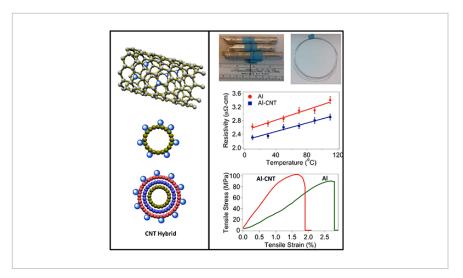


Diagram & Data

Technology Summary

Nanostructures have become attractive additives to aluminum due to their unique properties. The technology uses carbon nanotube hybrid as reinforcement in the aluminum. This hybrid allows for an enhanced electrical conductivity, enhanced mechanical properties, enhanced thermal conductivity, and a reduced coefficient of thermal expansion while maintaining the unique lightweight properties of aluminum. These properties can be obtained by using an in situ inductive heating stirring mechanism to achieve uniform dispersion of the carbon nanotubes in the aluminum matrix. These nanocomposites can be used in electrical wires as a possible substitute for copper. This technology demonstrates the ability to improve the electrical, mechanical, and thermophysical properties of aluminum, thereby making it comparable to or better than copper.

Application & Market Utility

Al-CNT composite improves thermophysical and mechanical properties, as well as electrical conductivity. Composite still maintains lightweight properties of aluminum. Potential applications include the automobile, aerospace, structural, electronic and sports industries.

Next Steps

Composite wires have been fabricated and tested; looking to optimize the technology and achieve improvements in electrical, mechanical, and thermophysical properties.

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Licensing |

Keywords

- Carbon nanotubes
- conductors
- high performance
- composite
- metal matrix

Researchers

Kofi W. Adu

Assistant Professor of Physics Online Bio Website

Originating College

PSU Altoona

Office of Technology Management Contact

Swope, Bradley bas101@psu.edu 814-863-5987



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.