



Homogeneous CNTs Dispersions for Improved Physical Properties in Functional Systems



Material Science

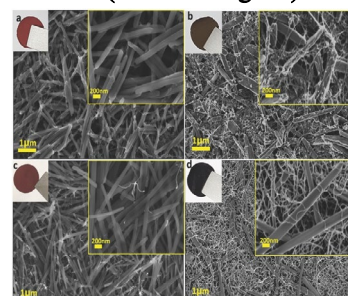
Reference Number: **1953+1809** \ Principal Investigators: **Prof. Boris Ryvchinski** \ Patent Status: **Fill in**

Industries such as energy, automotive, aerospace, and electronics demand materials that combine mechanical strength, thermal stability, and high electrical conductivity. Carbon nanotubes (CNTs) hold great promise, but their tendency to bundle limits uniform dispersion and undermines composite performance. Our technology enables homogeneous CNT dispersions for seamless integration into CNT-polymer composites and conductive porous films, preserving CNTs' intrinsic properties while enhancing mechanical strength, thermal stability, and conductivity.

Aqueous CNT dispersions



On-film CNT dispersions (SEM images)



Transparent Conductive Film



APPLICATIONS

- Lightweight structural and conductive components (automotive, aerospace, energy)
- Transparent electrodes, Porous electrodes, Buckypaper, Conductive spray
- Anti-static packaging and electronics
- EMI shielding and charge dissipation
- Sensors, water treatment membranes, optoelectronics, electroactive actuators, and conductive coatings

STAGE OF DEVELOPMENT

The group developed a simple, cost-effective method for CNT dispersion using organic dyes, enabling incorporation into polymers and ONC-CNT films. These dispersions form self-supporting conductive films, demonstrating improved photostability in solar cells and potential for supercapacitor and battery applications.

ADVANTAGES



Scalable and Cost-Effective



Wide Applicability: Supports a broad range of electrochemical transformations



Composites with superior mechanical & electrical properties



Environmentally Friendly

REFERENCES

- Niazov-Elkan et al., Adv. Mater., 2017.

