Background

- Carbon nanotubes (CNTs) possess unique properties and have been widely studied for over two decades.
- Random dispersion of CNTs in macroscopic assembly has largely lowered their properties and limited their applications.
- To explore the practical applications, CNTs have been recently assembled into macroscopic fibers.
- A general method to prepare highly aligned CNT sheets and fibers from CNT arrays is developed.

The aligned CNT materials show excellent mechanical and electrochemical properties.

Synthesis of CNT array

Synthesis process and characterization of spinnable carbon nanotube array using ambient pressure chemical vapor deposition.

Preparation of sheet and fiber

Illustration of aligned CNT film and fiber continuously drawn from CNT array.

Fiber property

Typical mechanical and electrical properties of CNT fibers and textures composed of CNT fibers.

Conclusion

- Spinnable CNT arrays is synthesized with high quality by a chemical vapor deposition process.
- High performance aligned CNT sheets and fibers are dry drawn from spinnable CNT arrays.
- The aligned CNT sheet and fiber exhibit high electrical conductivities and flexibility and are promising for flexible energy devices.

Representative publication