Licensable Technologies

Chemical Synthesis of Nano-Structured Chiral Conducting Polymers

Applications:

- Diagnosis and treatment of cancer
- Gold Coated nanoparticles can be used in an array of biotechnology applications

Benefits:

- Low incidence of false positive/ negative diagnosis
- Simple, quick method for detection, visualization and treatment of cancer cells
- Non-invasive treatment
- Does not use any radiation
- Gold coating on nanoparticles increases biocompatibility for

technique

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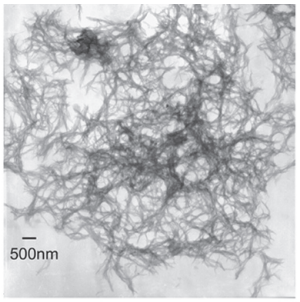
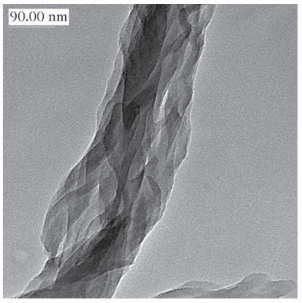
Summary:

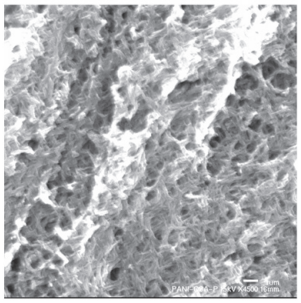
Los Alamos National Laboratory (LANL) has an extensive patent portfolio in conducting polymers (plastics that conduct electricity). Conducting polymers have a number of applications including electronics, light emitting devices (LEDs), artificial muscles, aerospace engineering, and much more. One exciting component in the conducting polymer portfolio is the invention for chemical synthesis of nano-structured chiral conducting polymers.



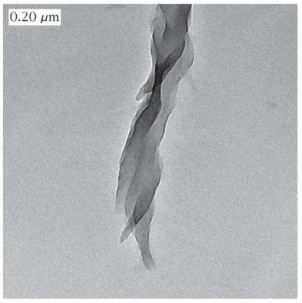
Fiber diameter from 20–100 nm



Bundle of PANI helical nanofibers



SEM of the as-cast film from PANI nanofiber suspension



The invention describes a novel method for producing conducting polymers from polyaniline. The production of these polymers can be done in water and produces highly chiral, electrically conducting 30–40-nm-wide nanofibers and 30–120-nm-diameter nanotubes.

The chirality of the polymers made with this method is much higher than any previously reported chiral conducting polymers, making the invention an excellent material for chiral recognition and separation. This is especially relevant to the pharmaceutical industry, for which separation of different drug enantiomers is a particular challenge. Chiral conducting polymers made with the LANL-developed technology offer an inexpensive new method for obtaining enantiomeric pure compounds. Additionally, using the water-soluble, chiral conducting compounds in drug synthesis should help to maximize the yield of one enantiomer over another, resulting in lower costs for downstream separations. The conducting polymer herein described is also water soluble, making it environmentally friendly. Chiral polyaniline can also be used as a sensitive material for the detection of biological and chemical compounds.

Development Stage:

The inventor has made a number of samples and a prototype is available for testing.

Patent Status:

Patent pending for this invention. This invention is part of a large conducting polymer patent portfolio consisting of 13 issued patents.

Licensing Status:

Available for exclusive and non-exclusive licensing.

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