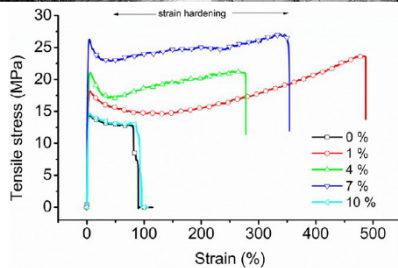
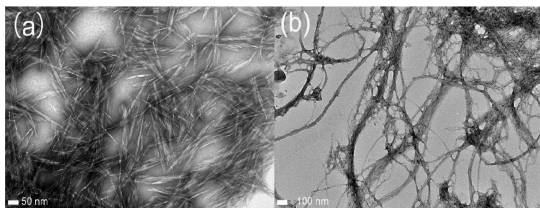
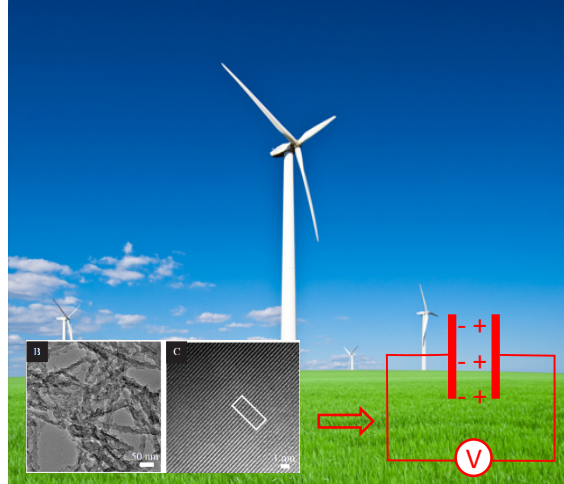


NDSU Engineering Grand Challenge Project Examples

Using Agricultural byproducts to Produce Supercapacitors and Batteries

The US government has committed to cut greenhouse gas emissions by 28% below 2005 levels by 2025. Electricity production and transportation are the two largest sources of greenhouse gases (56% combined). Renewable energy and electric vehicles are widely recognized as the solutions to the problem. However, intermittent renewable energy (solar, wind, etc.) and electric vehicles require high-capacity energy storage devices to function. Creating electrodes with nanoscale features is the key to develop high performance batteries and supercapacitors. In this project, these electrodes will be produced using renewable, low value agricultural byproducts. This research will contribute to achieving a sustainable, eco-friendly future.



Nanofibers from Plants for High Performance Polymer Composites

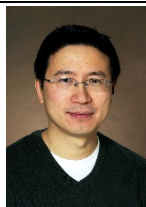
Cellulose nanofibers isolated from plants (trees, grass, crops, etc.) show extremely high mechanical properties, which allow them to be used as “green” nano-reinforcement to produce high performance composites (think about carbon fiber composites used in race cars, Boeing 787, golf clubs, etc.). In this project you will have the opportunity to produce cellulose nanofibers from a series of bio-sources and use them to develop various polymer nanocomposites for a wide range of applications.

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