TECHNOLOGY

High Surface Area Nanostructured Polyimide

OVERVIEW

Background
Supercapacitors are used for energy storage in applications that require frequent short duration charge and discharge cycles at high current. Energy density of supercapacitors can be boosted by increasing surface area of the electrodes and the use of nanomaterials for this purpose shows promise.

Innovative Technology
Researchers at the University of Maryland have developed very high surface area nanostructured polyimide “grass” that can be used as a template for supercapacitor electrodes and other applications. In comparison to existing methods for plasma etching of polyimide, the new process produces much taller (2.4 mm) “nano-grass.” The UMD researchers explored the use of the template for supercapacitor electrodes as the first application of the new polyimide “nano-grass.” The high surface area polyimide template was conformably covered using Atomic Layer Deposition to fabricate supercapacitor electrodes and micro supercapacitor.

APPLICATIONS

Supercapacitor electrodes
Chemical biological sensor surfaces
Mechanically compliant film
Thermally insulating layer
Antireflective coatings

ADVANTAGES

High surface area
Taller polyimide “nano-grass”

CONTACT INFO

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Additional Information

INSTITUTION

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EXTERNAL RESOURCES

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