



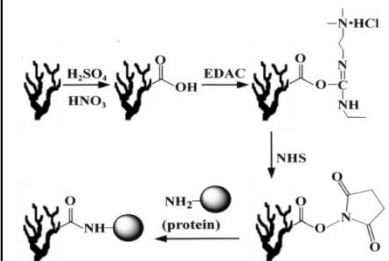
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## Functionalization of Multibranched Carbon Nano-Rods for sensing Applications

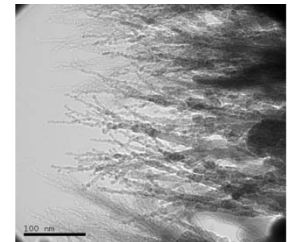
**IRG 4  
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Multibranched amorphous graphitic carbon nanostructures were grown on porous alumina substrates to be used in protein immobilization applications. On one hand, the fractal array of the branches in each nanostructure minimizes steric effects and offers a larger number of active sites per nanostructures than related systems like carbon nanotube bundles. At the other hand, their morphological structure makes them mechanically stable to withstand chemical manipulations required by the immobilization protocols. In this work we report the synthesis and the characterization of the nanostructures and introduce the procedures used to activate the surface.



The nano-trees are first carboxylated using a strong acid solution. The carboxylic acid groups are converted to active esters via diimide-activation, and then the active esters are reacted with the amine groups on proteins without the presence of diimide.



**Applied Physics Letters.**

"High energy density MIM Capacitors with Ba[(Ni<sup>1/2</sup>,W<sup>1/2</sup>)<sub>0.1</sub>Ti<sub>0.9</sub>]O<sub>3</sub> thin films"

UMASS CHM 2006 Fall meeting, MRS 2007 Fall meeting, NASA Visit 2006-2010, MRS 2009 fall meeting, EPSORE annual meeting 2010, Internship at NASA GRC summer 2010