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Electrochemistry of 2-dimensional networks of carbon nanotubes
PORNNIPA VICHCHULADA, MARCUS LAY, University of Georgia — Electrochemical studies of 2-dimensional networks of carbon nanotubes (CNTs) will be presented. A new method of creating electrically continuous arrays of CNTs has been used to investigate electrodeposition of nanostructures at highly oriented nano-scale templates. Unidirectional air flow was used to order CNTs in aqueous suspension and deposit them on a hydrophobic SAM-modified surface (i.e. 3-aminopropyltriethoxysilane on Si/SiOx). These 2-dimensional networks of CNTs show potential as a method of circumventing the difficulties associates with lack of control over the electrochemical properties of individual CNTs. For a random distribution of CNTs, density control is the major factor controlling device properties, as fluctuations in characteristics of individual CNTs are averaged. These ordered arrays of CNTs exhibited anisotropic electrical conductivity over macroscopic lengths (up to 3″), and have shown promise in a wide variety of electrochemical applications. Electrochemical reduction of water-soluble diazonium salts will be discussed.

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