Paper ID: 31719
student

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Specialised Technologies, Including Nanotechnology (8)

Author: Ms. Jendai Robinson
University of Cincinnati, United States, robin2jo@mail.uc.edu

Dr. Jessica Koehne
National Aeronautics and Space Administration (NASA), United States, jessica.e.koehne@nasa.gov
Dr. William Heineman
University of Cincinnati, United States, heinemwr@ucmail.uc.edu
Dr. Meyya Meyyappan
National Aeronautics and Space Administration (NASA), United States, m.meyyappan@nasa.gov
Dr. Laura Sagle
University of Cincinnati, United States, saglela@ucmail.uc.edu

EMPLOYMENT OF VERTICALLY ALIGNED CARBON NANOFIBER ARRAYS FOR LEAD DETECTION BY ANODIC STRIPPING VOLTAMMETRY

Abstract

A nanoelectrode array of vertically aligned carbon nanofibers was used for the determination of trace heavy metal ions by anodic stripping voltammetry. Pb2+ was used as a representative system in this study providing well-defined stripping voltammograms. A detection limit of 56.44 nM for lead was obtained which is well below the environmental requirements. The detection sensitivity is 3500 to 11,800 mA/M depending on the density of the nanoelectrode array. The attractive behavior of the carbon nanofiber electrode provides a safe and nontoxic alternative to the mercury electrodes commonly used in electrochemical stripping analysis.