University of Hawai`i at Mānoa

Hawai`i Natural Energy Institute

School of Ocean & Earth Science & Technology

Imaging Ellipsometry Technique and Results

An increasing research interest in nano materials and processes brings new requirements to characterize these materials, where most of the conventional analytical techniques are hampered by their intrinsic limitations. There are strong needs for in-situ, non-destructive measurements with nano-scale resolutions. This is our motivation for establishing such a technique for studying materials and processes in such premises.

The technique we are describing is capable of simultaneously measuring changes in mass, ellipsometric angles, and electrochemical parameters in cyclic voltammetry to reflect a material's synthesis conditions and the underpinning process mechanistically. This capability is achieved by combining the following techniques: quartz crystal microbalance (QCM), imaging ellipsometry, and electrochemical measurements in a synchronized manner. In this presentation, we will discuss the principles of QCM and imaging ellipsometry. We will use electrochemical deposition of methylene green film as an example, to demonstrate the utility of this approach.

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Tuesday, February 27, 2007
3:15 – 4:15 PM
POST 723

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