OAK RIDGE NATIONAL LABORATORY
Managed by UT-Battelle for the Department of Energy

Electrochemical Force Microscopy

Disclosure Number

201303202

Technology Summary

We have established an approach for electrochemical measurements in polar liquids, combining the force-sensitivity of SPM with the ability to probe the bias and time dependence of material-dependent electrochemical dynamics at the tip-sample junction and spatially across boundaries between dissimilar materials. This approach provides a framework to elucidate details of electrochemical processes at the solid-liquid interface. EcFM has the potential to provide fundamental insight into ionic charge diffusion and relaxation as a function of tip-sample separation and frequency (AC voltage and DC bias sweeps) in equilibrium and quasi-static regimes, and may be combined with measurements of current for direct comparison with conventional electrochemical measurements. It is believed that EcFM measurements will be useful in the study of local electrochemically-induced changes in charge density due to both ion adsorption/desorption and electron transfer at the liquid-solid interface and other phenomena central to biological and energy research.

Inventor

KALININ, SERGEI V

Center for Nanophase Matls Sciences Div

Licensing Contact

SIMS, DAVID L
UT-Battelle, LLC
Oak Ridge National Laboratory
Rm 124C, Bldg 4500N, 6196
1 Bethel Valley Road
Oak Ridge, TN 37831

Office Phone: (865) 241-3808
E-mail: SIMSDL@ORNL.GOV