Tuesday Evening, November 8, 2022

Chemical Analysis and Imaging Interfaces Focus Topic
Room Ballroom A - Session CA-TuP

Chemical Analysis and Imaging Interfaces Poster Session

CA-TuP-1 The Metrology Platform for in Operando Characterization of the Diamond Based High Power Devices and Detectors*, **Andrei Kolmakov,*** NIST

The unique electronic, physical, and thermal properties of diamond make diamond-based devices one of the most prospective for high-power electronics and detectors. The doping of diamond, however, appears to be a challenge due to high activation energy of the common p- or n-dopants. Alternative p-type doping via diamond surface hydrogenation is a key process to fabricate modern high mobility FETs.

Here we report on a simple design of the remote plasma reactor for gentle diamond surface hydrogenation. To avoid the uncontrolled surface adsorption of acceptor-like adsorbates and related band bending the design of the reactor is made as a vacuum suitcase to transfer the as-prepared device between different characterization facilities. We demonstrate the lithographic procedures and performance of the corresponding devices via measuring the properties of the electron detector and high mobility FET devices.

CA-TuP-2 Using Complimentary Characterization Techniques to Understand Interfacial Phenomena*, **Vincent Smentkowski,*** GE-R*; I. Spinelli, M. Knussman, M. Larson, J. Della Villa,* 1 Research Circle

Coatings and films are frequently applied to (or form on) substrate materials for a variety of reasons.Robustness of the coating is often dependent on the microstructure and/or cleanliness of the substate prior to deposition of the coating.In this presentation, we will show that the best understanding of the interfacial chemistry is obtained when multiple, complimentary, characterization techniques are used; namely scanning electron microscopy (SEM), transmission electron microscopy (TEM), energy dispersive spectroscopy (EDS), time of flight secondary ion mass spectroscopy (ToF-SIMS), metallography, and focused ion beam (FIB).The benefits of 3D analysis will be highlighted.We will also address the limitations associated with each of the techniques.

Author Index

Bold page numbers indicate presenter

— D —
Della Villa, J.: CA-TuP-2, 1
— K —
Knussman, M.: CA-TuP-2, 1
Kolmakov, A.: CA-TuP-1, **1**
— L —
Larson, M.: CA-TuP-2, 1
— S —
Smentkowski, V.: CA-TuP-2, **1**
Spinelli, I.: CA-TuP-2, 1