Monday Morning, April 23, 2018

Plenary Lecture
Room Town & Country - Session PL

Plenary Lecture

8:00am **PL-1 Predictive Synthesis and Characterization of Oxide Films with Metastable Structures***, **Gregory Rohrer**,* Carnegie Mellon University, USA
INVITED

Directed synthesis methods that access specific crystalline polymorphs are of great interest in crystal growth, materials design, and the production of useful coatings. This talk will describe how a new method, called combinatorial substrate epitaxy (CSE), can be used to understand the preferred epitaxial orientations of a wide range of heteroepitaxial structures and to fabricate various novel metastable materials. In this approach, the target compound is deposited on polished polycrystalline substrates, rather than commercial single crystals or buffer layers. It has been demonstrated that each surface grain in the polycrystalline substrate can be treated as the equivalent of a single-crystal surface in a traditional film growth experiment, therefore providing every combination of substrate orientation in a single experiment. The method has the unique advantage of not being restricted to the use of commercially available single crystals. The local structures of the growth products are analyzed using electron backscatter diffraction (EBSD). In this talk, the CSE method will be described in detail as will the analysis of EBSD data from thin film polymorphs. Examples of how the method has been used to grow metastable polymorphs will be described and a prognosis for the use of CSE for the development of new coatings will be discussed.

Author Index

Bold page numbers indicate presenter

— R —
Rohrer, G: PL-1, **1**