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Orientation of Vanadium Dioxide Grains on Various Substrates

FELIPE RIVERA, Brigham Young University, ROBERT DAVIS, RICHARD VAN-FLEET — Crystalline vanadium dioxide VO_2 experiences a fast and reversible semiconductor-to-metal structural phase transition near 68°C . The changes exhibited during this phase transition comprise a well known change in resistivity of several orders of magnitude, as well as a significant drop in optical transmittance in the infrared. Due to the changes in these optical and electronic properties, vanadium dioxide shows promise as a material to be used in many applications ranging from thermochromic window coatings to optoelectronic devices. However, since there is a structural component to the phase transition of VO_2 , it is of interest to study the orientation of the crystalline grains deposited. Substrates such as glass, SiO_2 , Sapphire, and TiO_2 have been used for the deposition of this material. We used orientation imaging microscopy to study and characterize the orientation of the grains deposited on several of these substrates. Here we present results on this study.

Felipe Rivera
Brigham Young University

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