

VO₂ Thin Film Grown on TiO₂ Substrate for Studies of Metal Insulator Transitions

Xing Zhong, Xueyu Zhang, Patrick LeClair, Arunava Gupta

Abstract

Epitaxial vanadium dioxide (VO₂) thin films have been deposited on TiO₂ (100) substrates by both low pressure CVD and atmospheric pressure CVD systems. The lattice parameters and strains of the films have been characterized. An elongation of the in plane b- and c-axis and a compression of the out-of-plane a-axis have been found. A reduction of the metal-insulator transition temperature (T_{MI}) from 341 K for bulk to 325 K has been observed in the VO₂ films. Impedance spectroscopy has been performed for the VO₂ films from 100 Hz to 1 MHz, indicating the film capacitance vanishes above T_{MI} .