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Structural analysis of the surface of bilayered ruthenate $\text{Sr}_3\text{Ru}_2\text{O}_7$

BIAO HU, University of Tennessee, Knoxville, TN, D. MANDRUS, A.P. LI, M.H. PAN, Oak Ridge National Laboratory, Oak Ridge, TN, SHUHENG PAN, University of Houston, Houston TX, V.B. NASCIMENTO, E.W. PLUMMER, Louisiana State University, Baton Rouge, LA, R. JIN, Louisiana State University, Baton Rouge, LA and Oak Ridge National Laboratory, Oak Ridge, TN — The bilayered ruthenate $\text{Sr}_3\text{Ru}_2\text{O}_7$ exhibits interesting structural properties. For example, in the bulk the in-plane lattice parameter a expands while the out of plane lattice parameter c contracts as temperature increases, accompanied by a rotation of RuO_6 octahedra. Remarkably, the broken translational symmetry at the surface causes a tilt of RuO_6 octahedra. The Low Energy Electron Diffraction (LEED) $I - V$ analysis shows that the tilt angle of RuO_6 is temperature dependent and hysteretic. The correlation between RuO_6 tilt at the surface, the surface thermal expansion, and the electrical properties were investigated using Scanning Tunneling Spectroscopy, (LEED)- $I - V$, and Scanning Electron Microscopy.

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