

Abstract Submitted  
for the TS4CF08 Meeting of  
The American Physical Society

**High-Temperature Phase Transitions in CsH<sub>2</sub>PO<sub>4</sub>**<sup>1</sup> CRISTIAN BOTEZ, JUAN HERMOSILLO, Department of Physics, University of Texas - El Paso, JIANZHONG ZHANG, JIANG QIAN, YUSHENG ZHAO, LANSCE, Los Alamos National Laboratory, JURAJ MAJZLAN, Institute of Mineralogy and Geochemistry, University of Freiburg, RUSSELL CHIANELLI, Department of Chemistry, University of Texas - El Paso — In order to uncover the microscopic origin of the temperature-induced three-order-of-magnitude jump in the proton conductivity of CsH<sub>2</sub>PO<sub>4</sub> (superprotonic behavior), its crystal structure modifications within the 25 °C -300 °C temperature range under both ambient- and high-pressure conditions have been investigated using synchrotron X-ray diffraction. The high-pressure data show no indication of the thermal decomposition/polymerization at the crystal surface recently proposed as the origin of the enhanced proton conductivity [Phys. Rev B **79**, 054104 (2004)]. Instead, direct evidence that the superprotonic behavior of the title material is associated with a polymorphic structural transition to a high-temperature cubic phase has been found.

<sup>1</sup>Acknowledgment is made to the Donors of the American Chemical Society Petroleum Research Fund, as well as to the Texas Higher Education Coordinating Board and the Research Corporation for support of this research.

Cristian Botez  
University of Texas - El Paso

Date submitted: 15 Sep 2008

Electronic form version 1.4