

Abstract Submitted
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Proton **Conduction**
and Microstructure of Lanthanum Phosphates¹ GABRIEL HARLEY, LINDSEY KARPOWICH, LUTGARD DE JONGHE², University of California, Berkeley, 94720 — Lanthanum phosphate (LaPO₄) has been recently studied as a potential proton conducting ceramic electrolyte for fuel cells. The complexity of the La₂O₃ - P₂O₅ system, particularly in the 1000 - 1600K range, leads to the difficulty in forming phase pure LaPO₄ by traditional synthesis methods. Complex microstructures involving amorphous and crystalline phases at grain boundaries have been detected by high resolution transmission electron microscopy, and have been shown to affect proton conductivity by several orders of magnitude. A simple model is used to predict conductivity of the material based on grain size and grain-boundary phases, and experimental results match up well with the model. Conductivities as high as 3.6E-5 S/cm at 773 K were found for undoped LaPO₄.

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