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ABSTRACT (Continue on reverse if necessary and identify by block number) DC conductivity studies on a material of nominal composition Li_5AlO_4 in a wet environment at intermediate temperatures have been interpreted in terms of hydroxide ion conduction, leading to the possibility of using " Li_5AlO_4 " as an electrolyte for the electrolytic decomposition of water vapor. Close inspection of the Li-Al-O-H phase diagram reveals the compositions other than " Li_5AlO_4 " should show similar behavior. In this work, the results of DC conductivity measurements on several compositions in the Li-Al-O-H system are reported.			
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in the Li-Al-O-H System
at Intermediate Temperatures**

by

Lie-Yea Cheng, Steven Crouch-Baker and Robert A. Huggins

**Extended Abstract for a Paper to Be Presented at the
172th Meeting of the Electrochemical Society
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**Stanford University
Department of Materials Science and Engineering
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**Conductivity Studies on Hydroxide Ion Conductors
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It has been demonstrated that, in a wet environment at intermediate temperatures, a material of nominal composition Li_5AlO_4 will react with water to form LiOH (1,2). Under these conditions, " Li_5AlO_4 " will support continuous direct current in the presence of Pt electrodes. This has been interpreted in terms of hydroxide ion conduction, leading to the possibility of using " Li_5AlO_4 " as an electrolyte for the electrolytic decomposition of water vapor at intermediate temperatures (3,4).

The Li-Al-O-H quaternary phase diagram at intermediate temperatures has been constructed (5). Close inspection of this phase diagram reveals that compositions other than " Li_5AlO_4 " should behave in a similar manner. This work reports preliminary results concerning the DC conductivity of several compositions in the Li-Al-O-H system at intermediate temperatures.

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5. S. Crouch-Baker and R.A. Huggins, presented at the 6th International Conference on Solid State Ionics, Garmisch-Partenkirchen, FDR, Sept. 6-11, 1987.

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