

## Accepted Manuscript

P-type transparent conductive CuAlO<sub>2</sub> thin films prepared using atmospheric pressure plasma annealing

Hong-Ying Chen, Jian-Hong Ou

PII: S0167-577X(18)30778-X

DOI: <https://doi.org/10.1016/j.matlet.2018.05.036>

Reference: MLBLUE 24336

To appear in: *Materials Letters*

Received Date: 6 February 2018

Revised Date: 12 April 2018

Accepted Date: 8 May 2018



Please cite this article as: H-Y. Chen, J-H. Ou, P-type transparent conductive CuAlO<sub>2</sub> thin films prepared using atmospheric pressure plasma annealing, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.05.036>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# **P-type transparent conductive CuAlO<sub>2</sub> thin films prepared using atmospheric pressure plasma annealing**

Hong-Ying Chen\* and Jian-Hong Ou

Department of Chemical and Materials Engineering, National Kaohsiung University of Science and Technology, 415 Jiangong Road, Kaohsiung 807, Taiwan

## **Abstract**

Transparent conductive CuAlO<sub>2</sub> thin films prepared using atmospheric pressure plasma annealing are reported. The sol-gel-derived thin films on the quartz substrate were annealed using atmospheric pressure plasma of N<sub>2</sub>-10%O<sub>2</sub> at 700-800°C for 10 min. The CuAlO<sub>2</sub> phase was obtained at 750°C. The binding energies of the Cu-2p<sub>3/2</sub> and the Al-2p<sub>3/2</sub> of the thin films were centered at 932.6±0.2 eV and 73.3±0.2 eV, revealing the valence state of Cu<sup>+</sup> and Al<sup>3+</sup>, respectively. The direct and indirect optical bandgaps of the CuAlO<sub>2</sub> thin films were 3.58 eV and 1.81 eV, respectively. Additionally, the CuAlO<sub>2</sub> thin films had the conductivity of (1.42±0.1)×10<sup>-3</sup> S/cm with the carrier concentration of (1.32±0.13)×10<sup>14</sup> cm<sup>-3</sup>. Therefore, atmospheric pressure plasma annealing provides a feasible method for preparing CuAlO<sub>2</sub> thin films.

**Keywords:** CuAlO<sub>2</sub>, thin films, atmospheric pressure plasma, annealing, deposition.

**Corresponding author:** Prof. Hong-Ying Chen

(tel) +886-7-3814526 ext. 15130 (fax) +886-7-3830674 (e-mail) hychen@nkust.edu.tw

Download English Version:

<https://daneshyari.com/en/article/8012519>

Download Persian Version:

<https://daneshyari.com/article/8012519>

[Daneshyari.com](https://daneshyari.com)