Accepted Manuscript

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PII: S0040-6090(16)30070-0
DOI: doi: 10.1016/j.tsf.2016.04.011
Reference: TSF 35144

To appear in: *Thin Solid Films*

Received date: 18 November 2015
Revised date: 6 April 2016
Accepted date: 6 April 2016

Please cite this article as: Che-Chun Lin, Jung-Jie Huang, Dong-Sing Wuu, Chao-Nan Chen, Surface passivation property of aluminum oxide thin film on silicon substrate by liquid phase deposition, *Thin Solid Films* (2016), doi: 10.1016/j.tsf.2016.04.011

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ABSTRACT

The passivation layer of Al_2O_3 thin films prepared by liquid phase deposition on p-type (100) silicon substrate are investigated. The deposition solution of aluminum sulfate and sodium bicarbonate are used for Al_2O_3 thin films deposition. The concentration of the sodium bicarbonate in the deposition solution controls the deposition rate of Al_2O_3 thin films. The optimum condition is a pH value of deposition solution of 3.3 and annealing at 500°C in N_2 atmosphere for 30 min. The effective minority carrier lifetime and fixed oxide charge density are 124.51 μs and -2.15×10^{12} cm^{-2}. Compared with bare silicon substrate, the effective minority carrier lifetime has increased by 41 times after the Al_2O_3 passivation layer deposition.

Keywords: passivation, liquid phase deposition, aluminum oxide

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