

Abstract Submitted
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Synthesis of High Quality SiO₂ Film by Capacitively-Coupled Plasma CVD with Comb-Type Electrodes TAKAHIRO HIRAMATSU, TOKIYOSHI MATSUDA, TOSHIYUKI KAWAHARAMURA, MAMORU FURUTA, TAKASHI HIRAO, Kochi Univ. Technol., KOJI KANETAKE, HIROTAKA TOYODA, Nagoya Univ. — Recently, flexible displays with lightness and flexibility attract much attention as next generation displays. To achieve the flexible display, thin film transistors (TFTs) on a plastic substrate at low temperature should be fabricated. The low-temperature deposition of a gate insulator is one of the key technology for the low-temperature fabrication of TFTs. In this study, we design a capacitively-coupled plasma with comb-shaped electrodes for low-temperature deposition of SiO₂ films. The influences of the deposition parameters, such as the pressure and the distance between the substrate and the electrode, on the film properties of SiO₂ were investigated. The deposition rate increased with increasing the deposition pressure and decreasing the distance between the dielectric and the substrate (D_{d-s}). On the other hand, the BHF etching rate decreased as the deposition pressure and the D_{d-s} decreased, indicating that the densification of the films was enhanced. The deposited SiO₂ exhibit good insulating properties, which were the current density of 1.9 nA/cm² and the breakdown voltage of 7.4 MV/cm. These results indicate that the SiO₂ films deposited by a capacitively-coupled plasma CVD with comb-shaped electrodes can apply to the gate insulator of TFTs.

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