ABSTRACT

Recently, polycrystalline silicon (poly-Si) has received increasing attention because of its wide range of applications such as Thin Film Transistor (TFT) for liquid crystal display, solar cell, and image sensors. The growth methods of poly-Si include (1) Low Pressure Chemical Vapor Deposition (LPCVD), (2) Solid Phase Crystallization (SPC), and (3) Laser Crystallization (LC). The LC method is expensive and not suitable for mass production due to laser annealing. However, both LPCVD and SPC methods have high growth temperatures (above 600℃), requiring fused quartz or silicon substrates, which are costly.

In this project, the poly-Si film is deposited by the Metal-Induced Lateral Crystallization (MILC) technique at a temperature of 500℃, and the quality of the MILC poly-Si film is better than SPC, allowing the use of glass substrates. The annealing process uses Two-Step Rapid Thermal Annealing (Two-Step RTA) instead of Conventional Furnace Annealing (CFA) to decrease the time required in the process. This approach is cost-effective and facilitates mass production.

Keywords: MILC: Metal Induced Lateral Crystallization; LPCVD: Low Pressure Chemical Vapor Deposition; SPC: Solid-Phase Crystallization; LC: Laser Crystallization; Two-Step RTA: Two-Step Rapid Thermal Annealing; CFA: Conventional Furnace Annealing


