

Mobility enhancement using MIC Poly-Si TFT

조재현¹, Thanh Nga Nguyen¹, 이준신^{1,2}

¹성균관대학교 정보통신공학부, ²성균관대학교 에너지학과

We report on the fabrication of polycrystalline silicon (poly-Si) using the metal induced crystallization (MIC) method and its application to thin film transistor (TFTs). The top gate of the TFT, whose active layer used MIC poly-Si annealed for 1 h at 650°C, showed field effect mobility of 7.5 cm²/V·s. By increasing the crystallization time to 5 h, the quality of the MIC poly-Si was improved. The field effect mobility increased from 7.5 cm²/V·s to 15 cm²/V·s. In order to enhance channel mobility, the Si dangling bond, which is produced during the transformation from the amorphous phase to the poly-crystalline phase of silicon (Si), is reduced by using plasma hydrogenation. Measurements show that the field effect mobility reached 45 cm²/V·s after passivation by ICP-CVD.