

화학적기계적연마 공정으로 제조한 PZT 캐패시터의 공정 조건에 따른 강유전 특성 연구

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Ferroelectric characteristics of PZT capacitors fabricated by using chemical mechanical polishing process with change of process parameters

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Abstract : Lead zirconate titanate (PZT) is one of the most attractive perovskite-type materials for ferroelectric random access memory (FRAM) due to its higher remanent polarization and the ability to withstand higher coercive fields. We first applied the damascene process using chemical mechanical polishing (CMP) to fabricate the PZT thin film capacitor to solve the problems of plasma etching including low etching profile and ion charging. The $0.8 \times 0.8 \mu\text{m}$ square patterns of silicon dioxide on Pt/Ti/SiO₂/Si substrate were coated by sol-gel method with the precursor solution of PZT. Damascene process by CMP was performed to pattern the PZT thin film with the vertical sidewall and no plasma damage. The polarization-voltage (*P-V*) characteristics of PZT capacitors and the current-voltage characteristics (*I-V*) were examined by change of process parameters. To examine the CMP induced damage to PZT capacitor, the domain structure of the polished PZT thin film was also investigated by piezoresponse force microscopy (PFM).

Key Words : Chemical mechanical polishing (CMP), PZT

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