⟨SI-7⟩

$IrO_2/(Ba,Sr)TiO_3/IrO_2$ 커패시터에서 덩어리 또는 계면에 의한 전기 전도 현상
Bulk- or interface-limited conductions in $IrO_2/(Ba,Sr)TiO_3/IrO_2$ thin film capacitors.

황 철 성
서울대학교 공과대학 재료공학부

The influences of electron accumulation by the bending of bands in a $(Ba,Sr)TiO_3$ dielectric thin film on current conduction mechanisms, are studied. Schottky-type contacts, i e injection of electrons from the electrode to the insulator over the interfacial barrier height by thermionic emission, can be generated irrespective of whether the insulating film is accumulated or depleted For both cases, field-enhanced emission results from image-force-induced barrier lowering, so that the high-frequency dielectric constant should be applied However, the Ohmic conduction property can be obtained from only accumulated films. The detailed mechanisms of the Ohmic and non-linear field-dependent emission conductions are discussed with reference to the direction of band bending, not to the carrier concentration

The electrical conduction behavior of sputter grown $(Ba,Sr)TiO_3$ (BST) thin films having IrO_2 electrodes were studied under the assumption of a fully accumulated film The leakage current conductions were controlled by the Poole - Frenkel mechanism in a low field whereas it changed to thermionic field emission in the high field region The dielectric constant obtained from Poole - Frenkel fitting was approximately 300 ± 50 at 25℃ which was in a qualitative agreement with the value obtained from low-frequency capacitance measurements. The calculated interfacial potential barrier height at zero volt and effective mass of electrons from the thermionic field emission fittings were 1 03 eV and $0.06m_o$, respectively From the calculated values, the work function of IrO_2 electrode is estimated to be 5.11 eV

⟨SI-8⟩

강유전체 메모리의 개발 동향
Current research and development trend of FRAM

정일섭, 이인숙, 김창정, 정지원, 이준기, 이정호, 김정
삼성종합 기술원 MDS sector 반도체소자랩

비휘발성이며 고속동작이 가능한 강유전체 메모리 (FRAM)는 강유전체 박막의 분극특성을 이용한 것이다 현재 미국, 일본, 유럽, 한국의 반도체 회사들이 개발에 참여하여 집적도 증대 및 양산을 목표로 개발을 진행하고 있다. 본 논문에서는 강유전체 메모리의 동작원리에 대한 간략한 기술과 역사적인 배경, 집적화에 따른 문제점 및 대응 연구 현황, 향후 기술적인 추이에 대해 언급하고 64K FRAM과 현재 개발이 진행 중인 4M FRAM의 강유전체 capacitor 특성에 관한 연구 내용이 포함된다