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A STUDY ON THE DEPOSITION OF RuO_2 AND Ru WITH RUTHENOCENE BY METALLORGANIC CHEMICAL VAPOR DEPOSITION, Sung-Eon Park, Hyun-Mi Kim, and Ki-Bum Kim(Div. of Mat. Sci. & Eng., Seoul National University, Seoul 151-742, Korea)

The deposition of Ru and RuO_2 with ruthenocene as a precursor and oxygen as a reaction gas has been investigated. We have identified the effect of process parameters on the phases formed. It is observed that the decrease of the amount of precursor such as either by decreasing the carrier gas flow or by reducing the bubbler temperature leads to the decrease of deposition rate, and favored to RuO_2 formation. The incorporation rate of Ru was calculated from the deposition rate and the fraction of RuO_2 phase identified from x-ray diffractometry measurements. When the substrate temperature was changed from 225 to 500 °C, Arrehenius plot of the incorporation rate of Ru shows surface reaction controlled and gas phase diffusion controlled regimes. From the analysis of the effect of substrate temperature and incorporation of Ru, a model for the phase determination in RuO_2 CVD is suggested.

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PZT THIN FILM CAPACITORS GROWN BY RF MAGNETRON SPUTTERING. S. M. JUNG, Y. S. CHOI, Y. PARK, J. YI and J. T. SONG (School of EEC, SKKU, Suwon, 440-746, Korea)

Lead zirconate titanate (PZT) is an attractive material for the memory device applications. because of its high dielectric constant. We have investigated Pt and RuO_2 as a bottom electrode for a memory device of PZT thin film. The bottom electrodes and PZT thin film were prepared by using an RF magnetron sputtering method. To examine the film crystallinity, we varied the substrate temperature from room temperature to 400°C. The substrate temperature influenced the surface morphology and the resistivity of Pt and RuO_2 as well as the film crystal structure. We investigated an anneal temperature effect because Perovskite PZT structure acheived only after an elevated heat treatment. Surface morphology was observed by AFM as a function of post anneal temperature. A post anneal temperature less than 600°C is showed the resistivity of $2\times10^{-5}\Omega$-cm. This paper presents electrical properties of PZT thin film in conjunction with structural transformations. Electrical properties of PZT thin film were observed by I-V and C-V.

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ELECTRICAL PROPERTIES OF PZT THIN FILMS DEPOSITED ON LANTHANUM STRONTIUM COBALTATE ELECTRODE BY D.C. REACTIVE SPUTTERING, WON YOUL CHOI, I. D. KIM, J. H. PARK and H. G. KIM(Dept. Mat. Sci. and Eng., KAIST, 373-1 Kusong dong, Yusong gu, Taejon, 305-701, Korea)

Lanthanum Strontium Cobaltate thin films are used as electrodes and buffer layer. These layers are deposited on SiO_2/Si substrate at various temperatures by d.c. reactive sputtering. On LSCO layers, PZT thin film are cosputtered at 550℃ and top electrodes are deposited as LSCO and Pt respectively. The crystallinity and microstructure are studied as XRD, SEM, TEM. Electrical properties of PZT thin films used LSCO and Pt as top electrode is compared. The fatigue properties are dependent on both bottom and top electrode.

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ELECTRICAL PROPERTIES OF LEAD ZIRCONYL TITANATE THIN FILMS DEPOSITED ON LANTHANUM NICKEL COBALTATE, WON YOUL CHOI, I. D. KIM, G. P. CHOI, J. H. AHN, D. G. KIM, S. G. YOON* and H. G. KIM(Dept. Mat. Sci. and Eng., KAIST, 373-1 Kusong-dong, Yusong gu, Taejon, 305-701, Korea)(*Dept. Mat. Sci. and Eng., Chung-Nam Univ. 220 Kung-dong, Yusong-gu, Taejon, 305-764, Korea)

Lanthanum Nickel Cobaltate thin films are used as electrode and buffer layer. These layers are deposited on commercial SiO_2/Si and Pt/SiO_2/Si substrates at various temperatures by employing d.c. reactive sputtering. On these layers, PZT thin film are cosputtered at 550℃. The structure, microstructure and electrical properties are studied. In case of PZT on LNCO/Pt/SiO_2/Si, the PZT films are highly oriented along (100) direction. The films are dense and crack free. The fatigue properties are very good and considerable improvement in remanent polarization is observed.

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