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SURFACE ACOUSTIC WAVE CHARACTERISTICS AND HIGH POWER DURABILITY OF SiO_2 THIN FILMS DEPOSITED ON $LiTaO_3$ SUBSTRATE, HYUNG K. YANG, HYUN M. CHO AND JONG C. PARK(Materials & Components Research Team #3, KETI, Kyunggi 451-860, Korea)

Surface acoustic wave characteristics and high power durability of SiO_2 thin films on $LiTaO_3$ wafer have been investigated for SAW filter application in cellular phone systems. In order to examine those properties, SAW 1-port resonators and bandpass filters in the frequency range of 800MHz were fabricated. Theoretical SAW velocity and electromechanical coupling coefficient of $LiTaO_3$ with SiO_2 thin film were compared with the experimental results. Both results SAW velocity decreased as increasing the thickness of SiO_2 film due to mass loading effects of thin film. And coupling coefficient became smaller due to large dielectric relaxation in $SiO_2/LiTaO_3$ structure. Power durability Of SiO_2 films overcoated on electrodes of SAW filter will be also discussed..

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THE EFFECT OF DIELECTRIC RELAXATION ON DRAM OPERATION, BYUNG-TAK JANG, SEON-YONG CHA, HOON JANG and HEE CHUL LEE (Dept. of Electrical Eng., KAIST, Taejon, 305-701, Korea)

Recently, high dielectric materials such as $SrTiO_3$, $(Pb,Zr)TiO_3$ and $(Ba,Sr)TiO_3$ have attracted great interest as dielectric materials for giga-bit scale DRAM capacitors. In the range of DRAM operating voltage, the relaxation current of the high dielectric capacitor is important because the relaxation current is typically larger than the leakage current within the refreshing cycle. The time-varying relaxation current of high dielectric capacitor was reported to have the Curie-von Schweidler relation of $I(t) = I_0 \times t^{-n}$ ($n < 1$) and also is known to be related to the frequency response (C-f) by the Fourier transform.[1][2] But, nobody has shown practically the relationship between the time domain and the frequency domain responses. In this presentation, we calculate the Fourier transform of $I(t)=I_0 \times t^{-n}$ and compare $I(f)$ with $C(f)$ to show the equivalence. Finally, the applicability of the high dielectric material in DRAMs will be discussed in the aspect of dielectric relaxation.

[1] M. Schumacher, *et al.*, Integ. Ferroelectrics, 10, p. 232, (1995).
[2] T. Horikawa, *et al.*, Jpn. J. Appl. Phys., 34, p. 5478, (1995).

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Evolution of the Microstructure and the Electrical properties with the Excess Bi_2O_3 content in $SrBi_2Ta_2O_9$ ceramics, J. K. Lee, S. J. Kim and K. S. Hong (Dep. Mat. Sci. & Eng., Seoul National University)

More recently, Bi-layered compounds such as $SrBi_2Ta_2O_9$ has been suggested as new candidate for FRAM application. However, most studies were focused on thin film applications and a few experimental results for the bulk state were reported. In this study, $SrBi_2Ta_2O_9$ ceramics with high sintered density are fabricated and the effect of excess Bi_2O_3 content on ferroeletric properties is investigated. The microstructure, crystal structure and dielectric properties changed systematically with the content of the excess Bi_2O_3 content and the cause of this variation was studied with the help of a few characterization methods.

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BUFFER LAYER FOR PZT THIN FILMS ON Si(100) BY MOCVD USING ULTRASONIC SPRAYING, CHOON-HO LEE (School of Chemical and Materials Eng., Keimyung Univ., Taegu 704-705, Korea), SOON JA PARK (School of Materials Eng., Seoul National Univ., Seoul 151-742, Korea)

MFIS(mtal-ferroelectric-insulator-semiconductor)FET is the most probable candidate for the NDRO NVFRAM and so many insulating materials have been studied for the buffer between ferroelectric films and semiconductor substrate. In this research Mg_2TiO_4 thin films were fabricated on Si(100) substrate by MOCVD using ultrasonic spraying, and their characteristics as the buffer layer for the ferroelectric PZT thin films were studied. As the source materials the solutions of $Mg(DPM)_2 \cdot 2H_2O$ and $Ti(i\text{-}Pr_3)_2(DPM)_2$ in butanol and butyl acetate were used. Mg_2TiO_4 films grew with the high [111] or [100] preferred orientation perpendicularly to the substrate surface depending on the deposition condition, which promoted the [111] or [001] texture of the PZT films. Mg_2TiO_4 films showed the excellent properties as the reaction barrier layer between PZT and Si. The relative dielectric constants of the Mg_2TiO_4 films were about 15 and the electrical resistivity were dependant on the composition. The MFIS structure made in this experiment showed very good memory properties and its memory window was over 4V under the programming voltage of $\pm$5V.

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