## Sym. E : Magnetics

THIN FILM MAGNETS

### C-TUE-16

**FERROMAGNETIC RESONANCE OF $Co_{100-x}Hf_x$ THIN FILMS.** I. S. BAEK and C. O. KIM(Dept. of Mat. Eng., Chungnam National Univ., Taejon 305-764, Korea), S. H. LEE(Dept. of Phys., Chongju Univ., Chongju 360-764, Korea), Y. Y. KIM and W. Y. Lim(Dept. of Phys., Korea Univ., Chochiwon 339-700, Korea)

In order to investigate the temperature dependence of surface magnetic anisotropy in $Co_{100-x}Hf_x$ thin films deposited by DC magnetron sputtering method, we observed frromagnetic resonance (FMR) spectra. The surface modes and the spin wave modes of $Co_{84}Hf_{16}$ and $Co_{76}Hf_{24}$ thin films were observed in the temperature range of 113 K - 293 K. In the $Co_{68}Hf_{32}$ thin film, however, spin wave modes were appeared only below 233 K. It is turned out that both film surfaces have the easy axis parallel to the film plane because all surface magnetic anisotropy constants have negative values. As the temperature decreases, the $K_{s1}$ and the $K_{s2}$, which are surface magnetic anisotropy constant at the film-air and film-surface interface respectively, decrease slowly except for $K_{s2}$ of $Co_{84}Hf_{16}$ thin film.

## Sym. A : Silicon Process

ISOLATION & DIELECTRICS - I

### C-TUE-17

**Preparation of Low Temperature PECVD SiOF Film and its Integration Issues for Next Generation Devices,** Gil Sik Lee (Dept. of Electrical and Computer Engineering, Louisiana State University)

As the dimensions of integrated circuit continue to shrink, integration delay becomes an increasingly serious problem. One of the candidates to resolve this problem is Cu/(Ta or TiN)/SiOF system. However, the dependence of interface stability of (Ta or TiN)/SiOF on temperature and manufacturability is relatively unknown. In our work, the integration possibility of Ta/SiOF has been investigated. The SiOF film is prepared by plasma enhanced chemical vapor deposition incorporating CF4 as the fluorine source into SiO2 deposition process using Si2H6 and N2O as the silicon and oxygen sources, respectively. The rf power, chamber pressure, and substrate temperature were maintained at 50 W, 700 mTorr, and 180 C, respectively. The SiOF film which was deposited by flowing 40 sccm of CF4, 40 sccm of Si2H6 (5% in He), and 100 sccm of N2O under this process condition showed a dielectric constant of 3.5 with a leakage current of 5X10-7 A/cm2 up to an electric field of 3 MV/cm. The measured average breakdown field strength was 7.8 MV/cm. The barrier/adhesion layer was sputtered by Ta on the SiOF film. The interface stability of Ta/SiOF was examined by performing high frequency capacitance-voltage and ramp current-voltage measurements. In this presentation, the dependence of interface stability on structure,annealing temperature, and the conditions of SiOF deposition will bediscussed.

## Sym. A : Silicon Process

ISOLATION & DIELECTRICS - I

### C-TUE-18

Thermal Stabilities of the Inductively Coupled High Density Plasma CVD Oxide Films, Han-Min Kim, Su-Chan Kim, Seung-Jin, Lee, Sun-Ho Lee, Sang-Hwa Lee, Jik-Ho Lee, Sun-Oo Kim, Sang-Bum Kim, Sang-Yong Lee, Hyunchul Sohn, Hyug-Jin Kwon and Shinn-Kook Lee, Memory Product & Development Division, HYUNDAI Electronics Industries Co., Ltd, e-mail : hmikim@sr.hei.co.kr

Thermal stabilities of the HDP oxide films were studied with FTIR and TDS analysis. The HDP oxide films were deposited with varying the gas ratio of $SiH_4$ to $O_2$ from 0.63 to 0.77 ; the flow rate of $SiH_4$ and $O_2$ is 90 ~ 110 and 117 ~ 143 sccm, respectively. And the deposition temperature was varied in the range from 350℃ to 450℃ by controlling the RF bias power and backside He gas pressure. FTIR spectra of the HDP oxides show the peak of Si-OH stretching vibration. As increasing the gas ratio of $SiH_4$ to $O_2$, the oxide films shows an increase in Si-H bonds and a decrease in Si-OH bonds in chemical structure. TDS spectra of the HDP oxides show that Ar, $H_2$ and $H_2O$ are major spices outgassed from the oxide films, which would affect on the adhesion of the films to be deposietd on the HDP films. By controlling the process conditions of the HDP oxide films and by applying the annealing process above 400℃, the amount of outgassing was reduced significnatly.

## Sym. I : Polymers for Electronics

LED - I

### D-TUE-01

STUDIES ON CHARGE CARRIER MOBILITIES IN MOLECULAR MATERIALS FOR ORGANIC LIGHT EMITTING DIODES, TETSUO TSUTSUI (Graduate School of Engineering Sciences, Kyushu University, Kasuga, Fukuoka, 816-8580, Japan)

The effects of charge carrier mobilities on device performances in organic light-emitting diodes are reviewed. It is stressed that quantum efficiency of electroluminescence is no direct relation with charge mobilities but power efficiency may concern with charge carrier transport processes, because power efficiency is inversely proportional to drive voltage. Hole and electron mobility data on both vacuum-sublimed bulk films and polymer-dispersed films which have been evaluated by the authors are summarized. Some discussions on the relation between molecular structures and electron and hole mobilities are added. Real meaning of designing high mobility materials for light-emitting diodes will be discussed.