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THE EFFECTS OF THERMAL ANNEALING IN NEUTRON IRRADIATED SA508 CLASS 3 REACTOR PRESSURE VESSEL STEELS USING MAGNETIC TECHNIQUES. KEE OK CHANG[1]; T. S. KIM[1], S. L. LEE[1], S. S. PARK[1] C. O. KIM[2] (Korea Atomic Energy Research Institute[1], Dept. of Mat. Eng., Chungnam National Univ.,[2])

Irradiation-induced changes in magnetic parameters and hardness were measured in SA508 class3 steel surveillance specimens which were irradiated to a neutron fluence of $2.3x10^{19}n/cm^2$. Hardness has increased after irradiation. However,heat treatments gave rise to the marked decrease in hardness. In the case of magnetic measurements, it has been observed that BN signal and BN energy have dropped significantly after irradiation and incerased with ascending annealing temperature, while coercivity has increased due to the irradiation.This study showed that there were strong correlations between Microvickers hardness and magnetic properties by the measurements conducted on surveillance specimens of SA508 class 3 steel.

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RHEOLOGICAL CHRACTERIZATION OF ROD-LIKE SHAPE MAGNETIC PARTICLE SUSPENSIONS, CHUL A. KIM, J. S. LEE, I. S. SIM and H. J. CHOI (Dept. of Polymer Sci. & Eng., Inha Univ., Inchon 402-751, Korea)

Suspensions of magnetic particles have been extensively studied due to the many practical applications in particulate media and data storage industry. However, there are only limited studies on rheological characterization of single domain magnetic particle suspensions mainly due to flocculation behavior. In these flocculated systems, the flocs gradually break down, when shear rate or shear stress are increased, loose structures and then break up into smaller flocs releasing the immobilized fluid. In this process, the suspension systems appear the various rheological responses (elastic or viscoelastics, etc). The measurements of suspension viscosity, storage modulus and yield stress are used to obtain the dependence of viscous energy dissipation on the microstructural states of magnetic particle dispersions as well as the microstructural shape effects which are related to the magnetic particle orientation. In this work, we thereby apply the conventional rheometric technique to suspensions of rod-like magnetic γ-Fe_2O_3 and CrO_2, by studying the effects of microstructures and elastic behavior on measured viscosity, yield stress, storage modulus and recoverable strain of the suspensions

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FABRICATION OF LARGE MELT-TEXTURED LREBa2Cu3Oy SUPERCONDUCTORS AND THEIR TRAPPED MAGNETIC FIELDS, N. SAKAI, S.J. SEO, T. MIYAMOTO and M. MURAKAMI (SRL-ISTEC, 16-25, Shibaura 1-Chome, Minato-Ku, Tokyo 105-0023, JAPAN), S.I. YOO (School of Mat. Sci. & Eng., Seoul National Univ., Seoul 151-742, Korea)

OCMG(Oxygen-Controlled-Melt-Growth)-processed LREBa2Cu3Oy (LRE123, LRE: Nd, Sm, Eu, Gd) and their intermixture compounds are known to exhibit large critical current densities (Jc) in high fields at 77 K.Therefore, OCMG-processed LRE123 superconductors are highly attractive for bulk applications such as fly wheel system for energy storage, strong superconducting bulk magnets and etc.. For real applications, it is essential to enlarge the bulk dimension composed of a highly textured single grain. Top-seeded melt growth method is known to be the most useful one to fabricate such large bulks.

In this presentation, we report a successful seeding method for the top-seeded melt growth of large c-axis oriented LRE123 single grains in a reduced oxygen atmosphere and the important processing conditions affecting the trapped magnetic fields of fabricated large LRE123 bulks.

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AG CAPPING LAYER EFFECT ON MAGNETIZATION OF ULTRA THIN FE OVERLAYER ON AG(001), **Chanyong Hwang***(Materials Evaluation Center, KRISS, Daejon, Korea)

Capping layer has been ignored in thick magnetic films since the interface contribution is not quite large in their overall magnetic properties. Since the thickness of interests becomes smaller in magnetic multilayers or ultra thin magnetic overlayer in magnetic device, this effect can not be ignored anymore. Contrary to the conventional notion of the effect of capping layer, we have observed an enhancement of the Polar Kerr effect signal when we capped the 3ML Fe overlayers grown on Ag(001) at low temperature. Also, this enhancement is quite dramatic when we annealed the Fe overlayer grown at room temperature.

The increase of the Kerr signal can originate from two different phenomena. First, it can be the real enhancement of the magnetization in the direction perpndicular to the the plane. Spin-reorientation can not explain this since there is no magnetization in plane at the thickness of 3ML. Second, since the Kerr effect invloves an inter-band transition near the Fermi level, there can be some change in the vlaence band enhancing this trantion probabality to increase the Kerr signal. We have used STM and angle-resolved photoemission spectroscopy to find the real origin of this enhancement of the Kerr signal.

* Intial park of this work has been collaborated with A. Swan at ORNL.

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