Sym. D : Display Materials

PDP TECHNOLOGIES

B-TUE-18

PREPARATION OF SRTIO3:PR AL RED PHOSPHORS AND THEIR LUMINESCENCE PROPERTIES, **HOJIN RYU(Advanced Mat. Div, KRICT, Taejon, 305-600, Korea), J. K. PARK(Dept. of Mat. Sci. Eng., Ajou Univ., Suwon 442-749), H. D. PARK, and S. C. CHOI**

Field emission display(FED) has been watched with keep interest as a new kind of flat panel display. The future of FED technology depends heavily on the development of low voltage cathodoluminescent phosphor materials. The objective of this work is to develop the red phosphors of $SrTiO_3$:Pr, Al for FED application. A new $SrTiO_3$:Pr, Al phosphors has been prepared by the solid state reaction method using $SrCO_3$, TiO_2, $PrCl_3$, and $Al(OH)_3$. The samples were identified by XRD, BET, PDS, and SEM, and the optical measurement of their photoluminescence and low voltage cathodoluminescence was carried out. Under 325 nm excitation, the $SrTiO_3$:Pr, Al exhibited a very narrow-band red emission, peaking about 617 nm. The maximum of relative intensity of $SrTiO_3$:Pr, Al phosphor was obtained at $SrTiO_3$ added with 0.2 mol% Pr and 17 mol% Al. We obtained the $SrTiO_3$:Pr, Al red phosphor of a red luminous color exhibiting excellent chromaticity and higher luminous characteristics, as compared with the commercial Y_2O_3:Eu red phosphor. The results obtained in this work suggest that the $SrTiO_3$:Pr, Al will be candidates for the red phosphor in full-color FED.

Sym. E : Magnetics

BULK MAGNETS - I

C-TUE-01

THE LINK BETWEEN MAGNETIC PROPERTIES AND MICROSTRUCTURAL DEVELOPMENT IN RAPIDLY SOLIDIFIED NdFeB, R.W. McCallum, C.P. Li, K.W. Dennis, and M. J. Kramer (Ames Laboratory, Iowa State University, Ames, IA 50011)

Rapidly solidified NdFeB magnets are of a considerable of considerable economic importance with extensive applications ranging from computer peripherals to high-end power tools. The magnetic properties of this material are directly related to the microstructure, which develops during solidification. The shape of the magnetic hysterisis loop for various solidification conditions may be related to the degree of undercooling of the melt that is achieved prior to the nucleation of the crystalline phases. Depending on undercooling, the solidified ribbon may exhibit up to three distinct layers, amorphous, fine grained isotropic 2-14-1 crystals, and a course grained structure consisting of oriented Fe dendrites and course epitaxial 2-14-1 grains. The origin of these layers and their contribution to the magnetic hysterisis loop will be discussed.

Sym. E : Magnetics

BULK MAGNETS - I

C-TUE-02

ON THE COERCIVITY OF MELT-SPUN (Fe,M)-Nd-C ALLOYS (M = Cu, Al, Co, and Ni), T.S. JANG (Dept. of Met. & Mat. Eng., Sun Moon Univ., Asan 336-840, Korea) and D.H. CHO (Dept. of Met. Eng., Han Yang Univ., Ansan 425-791, Korea)

$Fe_{14}Nd_2C$ which is isostructural to $Fe_{14}Nd_2B$ is formed only by a solid-state transformation, but its formation rate in a cast magnet is extremely slow. One way to overcome its sluggish formation is to fabricate Fe-Nd-C alloys by melt spinning followed by a proper heat treatment of the melt-spun alloys. It has been shown that not only the right phase can be produced in a short time but also a relatively high coercivity can be easily obtained by this method. Therefore, to improve the magnetic properties of the melt-spun Fe-Nd-C, effect of small Cu, Al, Co, or Ni additions ($\leq$ 2.0 at%) on the microstructural development and the coercivity of the alloys was investigated in this study. Preliminary results showed that, in the alloys with small Cu addition, the overall transformation temperatures were lowered as the amount of Cu addition was increased. However the effective temperature window (~200°C) in which $Fe_{14}Nd_2C$ is stable remains unchanged. The grain size of $Fe_{14}Nd_2C$ tended to increase with the increase of Cu addition. With 0.5 at% Cu, the coercivity of 14.9 kOe can be obtained, which is about 30% higher than that (11.2 kOe) of the Cu-free specimen. Effect of other elements will be also presented.

C-TUE-03

EFFECTS OF ADDITIVE ELEMENTS ON THE BEHAVIOUR OF HYDROGEN IN PR-FE-B TYPE MAGNETIC ALLOY, **YOON B. KIM,** W. Y. JEUNG(Metal Processing Research Center, KIST, Seoul 136-791, Korea), and T. S. JANG(Dept. of Met. & Mat. Eng, Sun Moon Univ. Asan 336-840, Korea)

Hydrogen treatment such as hydrogenation, disproportionation, desorption and recombination(HDDR) process is now well established as a method of producing Nd-Fe-B type anisotropic magnet powder. In this study, the hydrogen absorption and desorption behavior of Pr-Fe-B type magnet alloys with different additive elements was investigated focusing on the disproportionation and recombination reaction in HDDR process. Except Ga and Co, no other elements caused the recombination reaction under hydrogen atmosphere in Pr-Fe-B type alloy. The addition of Co and Ga enhanced the recombination by reducing the recombination reaction temperature below 1000℃. On the contrary, Zr and Hf addition may not cause the recombination reaction but change the disproportionation reaction rate. The Pr-Fe-B type magnet powder which has a remanence of 10.3 kG and coercivity of 7.7 kOe was obtained by applying the HDDR treatment.

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