

Effect of viscosity of paste and speed of printing on green transparent dielectric during screen printing process in PDP

Gun-young Cha, Jeung-soo Huh

Jun-hyun Park, Hyung-sun Kim

alohagy@hanmail.net

phone : 053-950-6334

fax : 053-950-6335

To have cost down and get improved image quality and performance of plasma display panel, several factors have been developed including development of low price material and improvement in production for PDP front plate. In this work, viscosity and surface characteristics of transparent dielectric were investigated to find the optimum and low price materials fabrication condition of transparent dielectric paste. It was found that uniformity and transmissivity of green and fired dielectrics had some relationship with the kinds and content of binder, and solvent as well.

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Gun-young Cha, Jeung-soo Huh

Dept. of materials science and Metallurgy Eng. Kyungpook National University, Daegu,
702-701 Korea

Jun-hyun Park, Hyung-sun Kim

Dept. Mat. Sci. & Metal. Eng. Sunchon National University, Sunchon, 540-742 Korea

To reduce cost, get improved image quality of plasma display panel, several factors have been developed including development of low price material and improvement in production for PDP front plate. In this work, viscosity and surface characteristics of transparent dielectric were investigated to find the optimum physical and optical properties as well as low price materials in the fabrication of transparent dielectric paste. It was found that uniformity and transmittance of green and fired dielectrics had some relationship with the kinds and content of binder and solvent.

Recently, PDP industry is trying to design for low cost, low electric consumption and high quality of image as the main target to penetrate consumer market in display business^[1]. Regarding the cost effective point, renovation of process, development of low price materials and improvement in production in the panel section would be achieved. The method of its fabrication is

still following conventional process and gives many problems in the production of transparent dielectric layer in front panel^[2]. Therefore, we tried to find a suitable processing and optimize the conditions of fabrication which are appropriate to the work ability of screen printing process to produce transparent dielectrics.

In this paper, the effect of viscosity of paste and speed of screen printing on green transparent dielectric were studied

3. Experimental

The powder which has the same composition (Table 1.) as the commercial frit was prepared. The dielectric was fabricated with different condition, for example, viscosity of paste and speed of printing during screen printing process. After the fabrication of dielectric, the physical and optical characteristics were compared with the commercial one. For the optical measurements, UV-visible spectroscopy, transmittance were used and for the physical measurements (the surface morphology, uniformity) AFM (atomic force microscopy) was employed.

4. Results

The quality of viscosity, uniformity and transmissivity improved with the sintering time and the composition ratio of BCA and BC, but they deterioration with the amounts of the binder and the composition ratio of -terpinol.

The characteristics of surface and the uniformity after the sintering was the best between 15 and 18 which are the thickness of paste. the speed of screen-printing dose not affect them

5. Impact

Study of dielectric composition as low melting glass system has reported reference,

however, is not enough to study relationship of viscosity and uniformity of surface by vehicle. Through this work, we expect to get uniformity of surface and good image quality after finding optimum viscosity for screen printing.

6. Reference

1. J. Y. Jeong and H. Z. Bae, Proceed. IMID (2001)158
2. J.H.Park, B.H.Jung, K.J.Hong, J.S.Huh and H.S.Kim, KIDS, 2(2000) 36

Table 1. Chemical composition (in wt%)

Layers	PbO	SiO ₂	B ₂ O ₃	Al ₂ O ₃	CaO	CuO	ZnO	ZrO ₂	MgO
over	66.7	4.93	21.7	-	0.1	0.04	5.97	0.01	0.01
under	69.8	14.1	7.17	8.8	0.16	0.4	-	0.01	0.01