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Novel glass ceramic-type micropattern gas detector with PEG3C

A new glass ceramic plate (GCP) has been developed for a hole-type micropattern gas detector (MPGD). The material of the GP is crystallized photosensitive etching glass (PEG3C) made by HOYA CORP. The micropattern is structured in the glass by ultraviolet photolithography through a photomask. The PEG3C has greater bending strength than conventional glass, allowing one to form microstructures in a thickness of less than 200 micro m and an effective area of 30 cm × 30 cm.
Our first prototype of the MPGD made of PEG3C has a thickness of 150 micro m and an effective diameter of 20 mm. The diameter and pitch of each hole are 100 and 360 micro m, respectively. The electrodes are made of Cu/Cr fabricated onto the two flat surfaces of a plate. A basic performance test of the hole-type MPGD was carried out with an X-ray source for a Ne (90%) + CF4 (10%) gas mixture at 1 atm. A gain of up to 6×104 and an energy resolution of 18% were obtained for 6 keV X-rays. It has also been shown that there is little charging-up effect in the PEG3C. In this conference, we report on the characteristics of the novel hole-type MPGD with PEG3C.

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Primary author: Prof. TOKANAI, Fuyuki (Yamagata University)

Co-authors: Mr KIKUCHI, Hajime (HOYA CORPORATION); Prof. SAKURAI, Hirohisa (Yamagata Univ.); Mr SUGIYAMA, Hiroyuki (Hamamatsu Photonics); Ms TAKEYAMA, Mirei (Yamagata Univ.); Mr OHISHI, Noboru (Hmamatsu Photonics); Prof. GUNJI, Shuichi (Yamagata Univ.); KISHIMOTO, Shunji (KEK); Mr FUSHIE, Takashi (HOYA CORPORATION); SUMIYOSHI, Takayuki (Tokyo Metropolitan University); Mr OKADA, Teruyuki (Hamamatsu Photonics); Mr MORIYA, Toru (Yamagata Univ.)

Presenter: Prof. TOKANAI, Fuyuki (Yamagata University)

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