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Development of a new generation GEM using a fine ceramic

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In general, the GEM electrode is based on an organic material such as Polyimide or Liquid Crystal Polymer. However, they cause making short circuit between electrodes by discharge, emitting a lot of gas in high temperature envelopment, and more expensive by a lot of manufacturing process. Therefore the electrode has not higher reliability and the GEM in a sealed chamber is still not appearing in the market.

In order to increase the reliability and archive the sealed type GEM, we have developed a low cost electrode for GEM employing a fine ceramic and improving manufacturing method in successful.

The developed electrode has thickness of 100 micron, the hole diameter of 100 micron, the pitch of 200 micron, and the effective area of 225 square millimeter. The pressure of emitting out gas is less than 1.0×10^{-3} Pa at 100 degrees Celsius. The gain is approximately 500 in Ar/CO₂ gas mixture ratio of 70%:30% at applied voltage of 570 V.

We would like to report the development of the new generation GEM and result of evaluation of discharge and gain characteristics.

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