

Diffusion Depth Extraction of Gold Particles Thermally-Deposited on a Polystyrene Film Formed on a Ferroelectric Polymer

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A nanometer - thick polystyrene thin film was formed on the ferroelectric polymer film by a solution process. A metal electrode was deposited for electrical measurements. A typical ferroelectric hysteresis curve was observed in the polarization - voltage characteristic measurement. It was confirmed that the coercive voltage increased as the thickness of the polystyrene thin film increased. The voltage value applied to the polystyrene thin film was extracted by using the increased coercive voltage value, and the capacitance and the dielectric constant of the thin film were calculated. However, the dielectric constant tends to increase as the thickness of the polystyrene thin film decreases. It is more reasonable to assume that the effective thickness of the capacitor decreases because metal particles diffuse and penetrate into the polystyrene rather than presuming that the material properties of the actual polystyrene film are changed. The diffusion depth of metal particles extracted from this paper is expected to be an important factor in organic electronics engineering. The minimum thickness of the organic thin film can be determined from the diffusion depth, because it affects the operating voltage.

Biography:

Mr. J. W. Kim is an undergraduate student at Jeju National University in Korea, and her research interests are semiconductor memory devices. Mr. S. A. Rahman and Mr. S. A. Khan are graduate students in master course. Prof. Dr. W. Y. Kim is an assistant professor at Jeju National University in Korea since 2017. His research fields include applications of ferroelectric polymer and graphene process.