Variation of Dielectric Constant with Various Particle Size and Packing Density on Inkjet Printed Hybrid $BaTiO_3$ Films

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Abstract : $BaTiO_3$(BT) has high permittivity so that has been applied to dielectric and insulator materials in 3D system-level package integration. In order to achieve excellent performance of device, the BT layer should be highly dense. In this study, BT thick films were prepared by the inkjet printing method. And these films were cured at 280℃ after infiltration of polymer resin. As a result, we have successfully fabricated not only the inkjet-printed hybrid BT film but also metal-insulator-metal(MIM) capacitor without sintering process. Changes in the dielectric constant of BT hybrid film with particle size and packing density were investigated. The dielectric constant was increased with increasing packing density and particle size. Further, the BT hybrid film using two different size particles had even higher packing density and dielectric constant.

Key words : inkjet printing, MIM capacitor, dielectric constant, packing density