

Impact of coffee ring effect on the Al₂O₃ thick films by Using Inkjet Printing Process

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Abstract : We have investigated the impact of coffee ring effect on the inkjet-printed Al₂O₃ thick films. In a single solvent system such as Dimethylformamide, the coffee-ring-pattern has appeared on the edge of sessile drop after evaporation. The peak-to-valley height difference in Al₂O₃ coffee ring is over 2 μ m. This non-uniform deposition of Al₂O₃ over the surface leads to sever surface roughness of the inkjet-printed films. However, we have manipulated our printing parameters to improve the surface roughness and the packing density of the printed Al₂O₃ films. Our inkjet-printed Al₂O₃ films show 10 times smoother surface than the initially printed sample's surface. Also the packing density of the printed Al₂O₃ film becomes 70% of high packed Al₂O₃. In this presentation, we would like to present the key process parameters of the inkjet printing process to overcome the genetic coffee ring problem.

Key Words : Inkjet printing, dielectric thick film, packing density, coffee ring effect.