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Thermal Behavior of Direct-Printed Lines of Silver Nano-Particles

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We present the thermal behavior of direct-printed conductive lines of Ag nano-particles that were sintered at various times and temperatures. Using transmission electron microscopy (TEM) and optical profiler (OP), the effect of sintering temperature and time on the shape and microstructure evolution of the lines were analyzed. The measurement results showed that the structure became denser with grain growth as sintered at higher temperature. However, large pores also grew and central collapse of the lines became more significant. Investigating the effects of the concentration of the Ag nano-ink and the properties of substrate surfaces will be our future works.

Keywords: TEM, OP

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Microstructure and Electrical Resistivity of Inkjet-Printed Ag Interconnects

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For inkjet-printed metal interconnects for various applications, it is important to optimize the electrical performance, i.e. electrical resistivity, of the interconnects. In this talk, the relationship between the electrical resistivity of inkjet-printed Ag interconnects and the process conditions, e.g. annealing temperature, ambient and time, etc. will be discussed in terms of their microstructure characteristics. The isothermal annealing results show that the change in the electrical resistivity measured ex situ is dominated by the kinetics of change in microstructure. Available models for prediction of electrical resistivity based on microstructural features such as grain size, porosity or vacancy will be reviewed and accounted for.

Keywords: inkjet-printed Ag