

Screen printing of nanosized silver colloid

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Water-based conductive silver ink was prepared and its properties such as the proper concentration and curing temperature were studied to check out its conductivity. Nano-sized silver colloid was synthesized from chemical reducing method. Polyvinyl pyrrolidone (PVP) with two different molecular weight (MW=8000, 29000) were tested for their ability to stabilize silver colloids. And PVP with smaller molecular weight could produce silver colloids of sizes around 20nm. The ink with different silver concentration were checked out for good patterning using different mesh count, among which 60wt% silver ink is appropriate by 400 mesh count for screen printing. Continuous and conductive lines could be printed on glass substrates. We also checked out the variety of resistivity with the different curing time and curing temperature. Curing at low temperature such as 200°C for 5min was tested for sintering effect. For a line with width of 1mm, thickness of 2.12 μ m, it exhibited a resistivity of $1.81 \times 10^{-4}\Omega\cdot\text{cm}$, which could be treated as conducting lines for electronic applications.