

Abstract Submitted
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Sintering of Silver Nanoparticle Films LIWEI HUANG, YAYONG LIU, KAIKUN YANG, TOM XU, HOWARD WANG, Institute for Materials Research and Department of Mechanical Engineering, Binghamton University, State University of New York — The sintering process of silver nanoparticle (Ag-NP) films has been studied using time-resolved in situ electrical resistance measurements at various temperatures. Ag-NPs having an average diameter of 4.6 nm were spun-cast on Si wafers to form ca. 100 nm films. Upon heating on a hot stage, organic molecules at the surfaces of Ag-NPs evaporate; Ag-NPs fuse to form a conductive film. Two conduction mechanisms upon crossing the percolation threshold have been revealed. Electrons initially hop among growing particles and later transport through continuous networks. The transition from the former to the latter is associated with activation energy of ca. 600 meV.

Howard Wang
Binghamton University

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