

Abstract Submitted
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Atmospheric pressure plasma liquid deposition of Cu nanoparticles onto P4VP-grafted-PTFE surface and their autocatalytic characteristics¹ NOBUYUKI ZETTTSU, HIROKI AKIYAMA, KAZUYA YAMAMURA, Research Center for Ultra-precision Science and Technology, Graduate School of Engineering, Osaka University — We have demonstrated atmospheric pressure plasma-assisted Cu nanoparticle (NP) deposition onto a P4VP-g-PTFE surface, as well as their autocatalytic properties for the initiation of the following electroless Cu plating. The plasma-induced reduction of the organo-copper precursor gradually increased the surface Cu concentration owing to the formation of the Cu NPs with treatment time. The concentration became maximal, and then it progressively decreased with further plasma treatment. XPS, SEM, and AFM experiments revealed that the total population of NPs on the surface was clearly decreased, while the particles continued to grow. We found that thermodynamically driven spontaneous migration of Cu atoms occurred from the initially formed smaller particles to the larger ones, by the Ostwald ripening. The polymer surface densely seeded with Cu NPs enable the initiation of autocatalytic electroless deposition of copper layer with less than 5 s time lag.

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