

Effect of Island Shape on Dielectrophoretic Assembly of Metal Nanoparticle Chains in a Conductive-Island-Based Microelectrode System

Haitao Ding^a, Jinyou Shao^{a,*}, Yucheng Ding^a, Weiyu Liu^a, Xiangming Li^a, Hongmiao Tian^a and Yaopei Zhou^a

^a Micro- and Nano-manufacturing Research Center, State Key Laboratory for Manufacturing Systems Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, China

ABSTRACT

The electrical conduction quality of an electric circuit connection formed by dielectrophoretic (DEP)-assembled metal nanoparticle wires between small conductive elements plays a significant role in electronic devices. One of the major challenges for improving the electrical conductance of nanowires is optimizing their geometric morphology. So far, the electrical conduction quality has been enhanced by optimizing the AC frequency and conductivity of nanoparticle suspensions. Herein, the effect of the conductive island shapes on the dynamic process occurring in a DEP assembly of 10 nm gold nanoparticles was investigated in a conductive-island-based microelectrode system. The nanoparticle wires between the microelectrodes were assembled *in situ* from colloidal suspensions. The wires were grown in a much straighter route by increasing the geometric angle of the conductive-island tip. To

* Author to whom correspondence should be addressed; electronic mail: jyshao@mail.xjtu.edu.cn

Download English Version:

<https://daneshyari.com/en/article/5348698>

Download Persian Version:

<https://daneshyari.com/article/5348698>

[Daneshyari.com](https://daneshyari.com)