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Nanomanufacturing of Gold Nanoparticle Arrays Using Peptide-Derivatized Block Copolymer Templates[1] TINGLING RAO, Department of Polymer Science, University of Akron, GURPREET SINGH, Department of Polymer Engineering, University of Akron, SIBAI XIE, Department of Polymer Science, University of Akron, ALAMGIR KARIM, Department of Polymer Engineering, University of Akron, MATTHEW BECKER, Department of Polymer Science, University of Akron — Collective surface plasmons (SPs) displayed by two-dimensional (2-D) Au nanostructures are important for applications such as plasmonics and plasmonic sensing. However, methods for fabricating programmable highly-ordered arrays of Au nanoparticles with nanoscale precision are limited. Here, we report a peptide—derivated block copolymer based rout towards continuous fabrication of Au nanoparticle superlatice with tunable structures. We successfully obtain discrete, hexagonally-packed Au nanoparticle hierarchical structures where Au-to-Au nanoparticle spacing is precisely controlled by the underlying PMMA cylindrical phase of the block copolymer (BCP). Dynamic thermal field processing techniques offer a facile and continuous rout to tune the BCP assembly, thus enabling versatile arrangement of Au nanostructures from Au-dots to Au-lines. Our method may open a cost-effective way towards assembly of 2-D Au nanoparticles with tunable structures by carefully tuning molecular parameters – a promising step to novel nanodevices.

[1]Akron Functional Materials Center (AFMC) and The University of Akron Research Foundation

Tingling Rao
Department of Polymer Science, University of Akron

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