

Abstract Submitted  
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**Highly specific placement of Au Nanoparticles on chemical brush patterns prepared by combination of top-down and block copolymer lithography** SERDAR ONSSES, CHI-CHUN LIU, CHRISTOPHER THODE, SHENGXIANG JI, PAUL NEALEY, University of Wisconsin-Madison — Metallic nanoparticles (NPs) with interesting optical, electronic and reactivity properties show great promise for a range of scientific fields and technological applications, such as plasmonics, catalysis, and nanowire growth. However taking advantage of these properties, particularly for device fabrication often requires immobilization of pre-synthesized particles with high specificity and precise control of density and spacing of NPs at sub 100 nm scale. Here we show that lithographic patterning of a cross-linkable polystyrene brush and subsequent filling with poly(2-vinyl pyridine) (P2VP) leads to high contrast chemical patterns leading to site-specific placement of pre-synthesized Au NPs (13 nm) with the precise control of number from single to tens of particles per spot. Moreover we show that this approach is extendible to large area patterning of NPs with costs and process times suitable for technological applications using block-copolymer (BCP) lithography.

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