

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Synthesis and Assembly of Janus Gold Nanorods in Polymer Matrices ROBERT C. FERRIER, HYUN-SU LEE, MICHAEL J.A. HORE, MATTHEW CAPORIZZO, DAVID M. ECKMANN, RUSSELL J. COMPOSTO, University of Pennsylvania — Gold nanorods (AuNRs) possess unique optical properties that depend on the local orientation and separation of the individual rods. Previous research focused on assembling AuNRs either end-to-end or side-by-side in solution. Our group has explored the dispersion of polymer grafted AuNRs in polymer matrices. The present work investigates the end-to-end assembly of polymer grafted Janus AuNRs (JNRs) in polymer thin films. JNRs are synthesized by exploiting the anisotropic surface chemistry of CTAB-coated AuNRs. Poly(ethylene oxide) (PEO) brushes are grafted to the side of the AuNR, while leaving the ends unmodified. Using alkane dithiols of different lengths, the JNRs are covalently linked in various solutions and the optical properties are characterized by UV/visible spectroscopy. Linked JNRs are spin-cast in poly(methyl methacrylate) (PMMA) or PEO thin films and characterized via electron microscopy and UV/visible spectroscopy. Using this procedure, linked JNRs can be dispersed in a polymer matrix and linked end-to-end to control the optical properties of coating.

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Date submitted: 09 Nov 2012

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