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Tuning optical properties of gold nanorods in polymer films through thermal reshaping[1] RUSSELL COMPOSTO, ERIC MILLS, YU LIU, University of Pennsylvania — The thermal reshaping of gold nanorods (NRs) in a poly(methyl methacrylate) (PMMA) nanocomposite film is investigated by UV-vis and TEM. To ensure dispersion, the NRs are modified with PEG brushes, and then dispersed in PMMA. Thermal annealing of the PMMA:NR film results in a blue shift of the longitudinal plasmon resonance, caused by a decrease in the length of the NR. The rate of the blue shift increases as temperature increases from 100 °C to 200 °C, and the longitudinal absorption peak approaches a constant value that scales linearly with temperature. We demonstrate a potential application by fabricating a device with a gradient in optical properties.

[1]NSF/DMR and MRSEC Programs

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