Abstract Submitted
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Responsive metal/polymer nanocomposites via photothermal effect[1] MERVE SEYHAN, Rensselaer Polytechnic Institute and Yeditepe University, DENIZ RENDE, LIPING HUANG, Rensselaer Polytechnic Institute, SEYDA MALTA, Yeditepe University, RAHMI OZISIK, NIHAT BAYSAL, Rensselaer Polytechnic Institute — Metal nanoparticles can efficiently generate heat when exposed to electromagnetic radiation. The amount of heat generated and the temperature increase depends on the number of nanoparticles and their shape. In the current work, gold nanoparticles (AuNPs) were used as heat sources within polyethylene oxide (600,000 g/mol) via the photothermal effect. AuNPs were synthesized through Frens method, and were characterized using TEM. A laser source with a wavelength of 532 nm was used to heat AuNPs. Raman spectroscopy data showed that irradiation of AuNPs led to increasing temperature profiles in the vicinity of AuNPs, which is a result of the surface plasmon resonance. This property of AuNPs would enable the control of viscoelastic response of the polymer by altering crystallinity and temperature of the polymer matrix, thereby, providing responsive materials.

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