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Annealing effects on nanostructured gold-polymethylmethacrylate composites: Small-angle x-ray scattering analysis

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ABSTRACT

Composites formed of a polymer-embedded layer of sub-10 nm gold nanoclusters were fabricated by very low energy (49 eV) gold ion implantation into polymethylmethacrylate. We used small angle x-ray scattering to investigate the structural properties of these metal-polymer composite layers that were fabricated at three different ion doses, both in their original form (as-implanted) and after annealing for 6 h well above the polymer glass transition temperature (150 °C). We show that annealing provides a simple means for modification of the structure of the composite by coarsening mechanisms, and thereby changes its properties.

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