Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Nanoscale Steady-state Temperature Gradients within Polymer Nanocomposites Undergoing Continuous-Wave Photothermal Heating from Gold Nanorods

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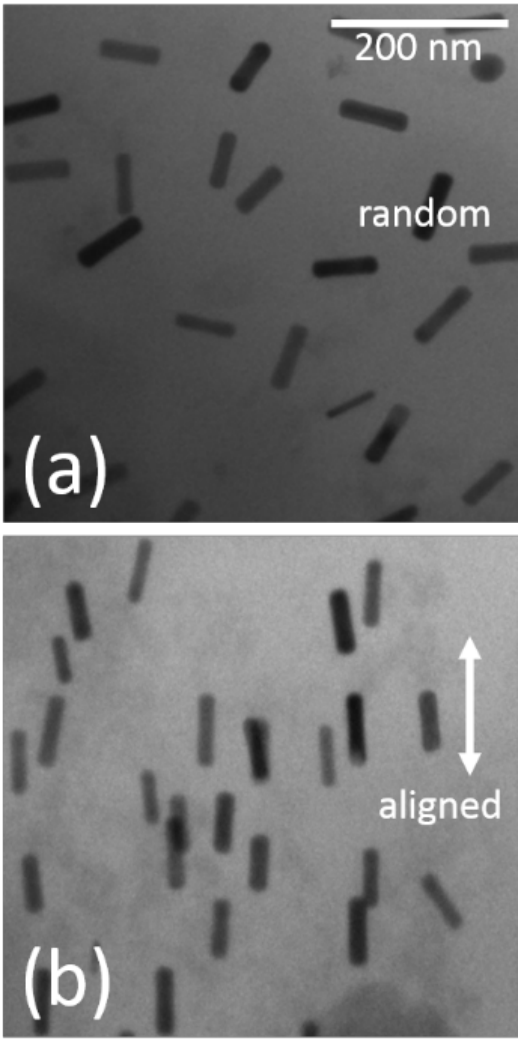

Figure S1. Photothermal- and field-assisted GNR alignment. (a) TEM image of as-fabricated PEO:GNR film having random nanorod orientations. Scale bar applies to both images. (b) TEM image same type of nanocomposite film after photothermal heating (4 W/cm^2 at 514 nm) simultaneously with an applied electric field of 20 kV/cm, resulting in global alignment (0 ± 8.1°) of the GNRs.

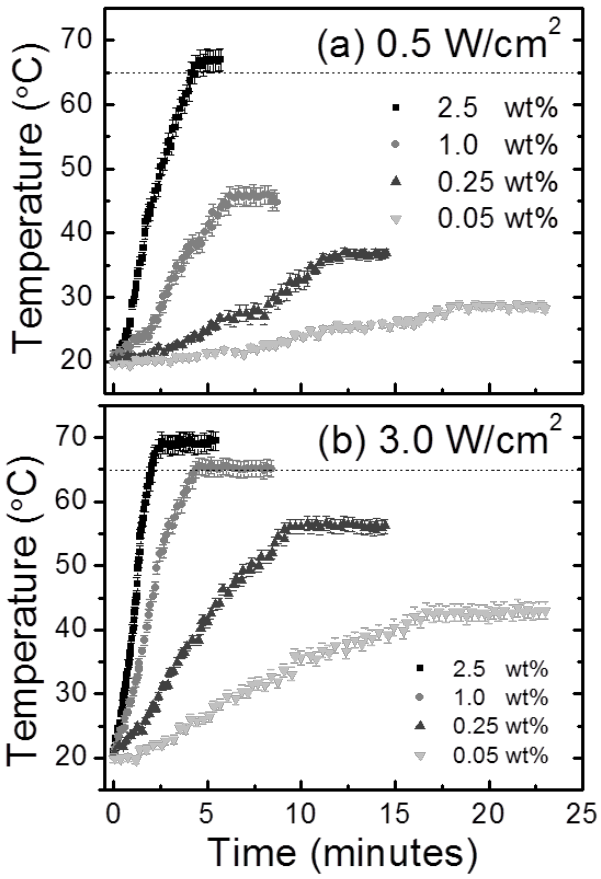

Figure S2. Average global sample temperature versus time for different GNR concentrations observed under different 514 nm illumination intensities, such as (a) 0.5 W/cm^2, and (b) 3.0 W/cm^2. Horizontal dotted lines in both graphs indicate T_m for PEO.

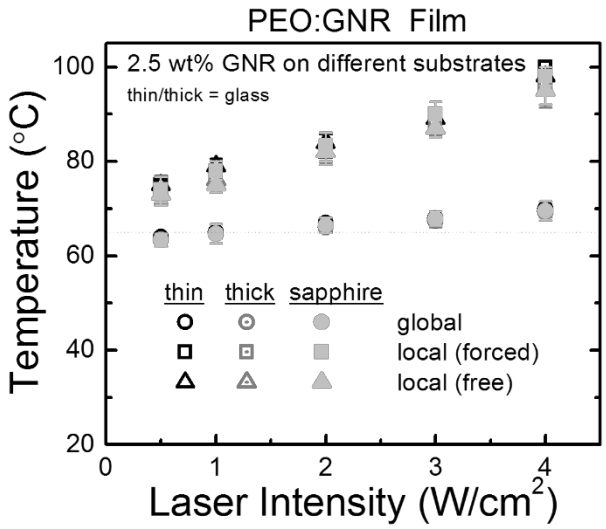

Figure S3. Temperature measurements are independent of substrate material composition or thickness. For thin PEO:GNR films containing 2.5 wt% nanorods, the average sample measurements (circle symbols) from observing perylene fluorescence as well as those from GNR reorientation rotational dynamics in both driven (forced, square symbols) or random (free, triangle symbols) modes, provide reproducible temperature values which overlap within error, reflecting the differences in the local versus the global temperatures. Thin and thick refer to glass substrates of varying thicknesses.