



Optical and Thermo-optical Properties of Polyimide-Single-Walled Carbon Nanotube Films: Experimental Results and Empirical Equations

NASA Technical Reports Server (NTRS), et al., Joseph G. Smith



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Optical and Thermo-Optical Properties of Polyimide-Single-Walled Carbon Nanotube Films: Experimental Results and Empirical Equations

By Joseph G. Smith

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 28 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. The incorporation of single-walled carbon nanotubes (SWNTs) into the bulk of space environmentally durable polymers at loading levels greater than or equal to 0.05 wt has afforded thin films with surface and volume resistivities sufficient for electrostatic charge mitigation. However, the optical transparency at 500 nm decreased and the thermo-optical properties (solar absorptivity and thermal emissivity) increased with increased SWNT loading. These properties were also dependent on film thickness. The absorbance characteristics of the films as a function of SWNT loading and film thickness were measured and determined to follow the classical Beer-Lambert law. Based on these results, an empirical relationship was derived and molar absorptivities determined for both the SWNTs and polymer matrix to provide a predictive approximation of these properties. The molar absorptivity determined for SWNTs dispersed in the polymer was comparable to reported solution determined values for HiPco SWNTs. This item ships from La Vergne, TN. Paperback.



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