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Effect of triboluminescent and thermographic phosphor powders on the thermal, mechanical, and optical properties of elastomeric composite materials

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In this study, photoluminescent, triboluminescent, and thermal response of elastomer-encapsulated thermographic phosphor powders and triboluminescent powders were investigated and will be reported. The effect of the additives at concentration levels of 5, 15, and 50% on the mechanical, thermal, and optical properties of Sylgard-184 elastomer was investigated, at room temperature and compared with the behavior of the neat polymer. Furthermore, the effect of polymer encapsulation on the emission and excitation characteristics of the powders was also investigated and fully characterised. Composite polymer samples containing different concentrations of select powders were prepared by combining Sylgard-184 (10:1 base to cross-linker ratio) with the approriate powder, mixed gradually, and then completely outgassed at room temperature and fully cured at 100 C for 1 hr. The results demonstrated a non-linear relationship between the powder concentration and the output intensity. The composite samples were also created in thin films by implementing a spin-coating technique before the outgassing and curing stage. The results of the dropcasting method were compared with the spincoated samples and fully characterised. Results of the mechancial, thermal, and, optical properties of all composite samples will be reported.

Biography

Firouzeh Sabri has completed her PhD in 2002 from the Cavendish Laboratory-Microelectronics and Semiconductor Physics Group. She has completed a Post-doctoral fellowship at NIH/NIDCD in Biophysics and a second Post-doctoral fellowship in Polymer Chemistry at UF, Gainesville. She is an Associate Professor and the Director of the MemphisCRESH summer research internship program, at the Universtiy of Memphis. She is the recipient of the 2008 APS Hildred Blewett Award. She is the Founder of the Bio, Nano, and Space Materials Laboratory at UoM.

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