

Abstract Submitted  
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**PDMS-BaTiO<sub>3</sub> Composites with Mechanically Tunable Optical Properties.** NASSER MOHAMED, MOISES HINOJOSA, VIRGILIO GONZALEZ, FIME-UANL — Novel composites that show visible light transmittance, mechanically tunable refractive index and good mechanical properties based on PDMS and BaTiO<sub>3</sub> (BT) nanoparticles (NP), were prepared in 2 steps. First, NP were obtained via mechanical milling; the BT was used as-purchased. Average particle sizes of ~100nm were selected. Second, the NP were embedded into PDMS by in-situ polymerization. PDMS from Dow Corning (Sylgard 184) was supplied as a kit containing 2 components: the Base and the Curing Agent. The BT content was varied up to 1.0wt%. Finally, thick films were prepared by solvent casting and cured in a vacuum furnace, where the trapped air and solvent were extracted. Weight content of the NP was examined. XRD and Raman confirmed the desired tetragonal phase of BT NP. Average particle size was determined by SEM. EDS maps revealed a homogeneous dispersion of the NP. UV-Vis analysis showed transmittances of ~70%. The ellipsometry results revealed that the wt% of BT significantly influences the optical response of the composite when it is stressed; however the response is not linear.

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