369. Title:High-refractive-index composite materials for terahertz waveguides: Trade-off between index contrast and absorption loss

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Source title:Journal of the Optical Society of America B: Optical Physics
Volume:28
Issue:4
Issue date:April 2011
Publication year:2011
Pages:917-921
Language:English
Document type:Journal article (JA)

Abstract:We fabricate polymer compounds from titania-doped polyethylene and characterize their linear optical properties by terahertz time domain spectroscopy. We show that the high concentration of dopants not only enhances the refractive index of the composite material, but it also can dramatically raise its absorption coefficient. We demonstrate that the optimal design of photonic bandgap fibers based on lossy composites depends on finding a compromise between the high-refractive-index (hRI) contrast and corresponding material losses. Finally, fabrication and transmission measurements for the hRI contrast hollow-core Bragg fiber are reported and compared with simulations.