

PI-POFS As Transducers for Sensors

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Abstract: *Polymer Optical Fibers (POFs) are gaining significant attention as transducers for sensors due to their unique properties, including flexibility, low cost, ease of fabrication, and ability to operate in harsh environments. This paper explores the potential of POFs, particularly those made from polymethyl methacrylate (PMMA) and other specialized polymers, in sensing applications such as strain, temperature, humidity, and chemical detection. By leveraging the interaction between the polymer material and the external stimuli, POFs can transduce physical changes into measurable optical signals. Additionally, the integration of Bragg gratings, micro-bending techniques, and fluorescence-based mechanisms in POFs enhances their sensitivity and accuracy. This review discusses the advantages of POF-based sensors over traditional silica optical fiber sensors, as well as the challenges in terms of durability and signal attenuation. Recent advancements in POF technology suggest a promising future for its application in smart sensing systems, particularly in fields such as structural health monitoring, biomedical applications, and environmental sensing.*

Keywords: Polymer Optical Fibers (POFs), Sensors, Transducers, Strain and Temperature Sensing, Fiber Bragg Gratings (FBGs)