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POLYMERIC OPTICAL FIBERS PRODUCED WITH POLYMETHYL METHACRYLATE/LAPONITE NANOCOMPOSITE

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Polymeric optical fibers (POF) have found a wide range of applications in medicine, civil engineering and construction.¹ Smart polymeric optical fibre fabrics act as “a second skin” and detect vital signals of the wearer’s body or changes in the wearer’s environment. In this contribution, nanocomposites of poly(methyl methacrylate) (PMMA) with laponite nanoparticles have been synthesized via suspension polymerization (Figure 1). To improve embedding of the silica nanoparticles within the PMMA matrix, the nanoparticles surface was chemically modified with different coupling agents.²⁻³ The polymers were characterized with Gel Permeation Chromatography (GPC), Nuclear Magnetic Resonance (NMR), Scanning Electron Microscope (SEM), Thermo Gravimetry Analysis (TGA), and Differential Scanning Calorimetry (DSC). Chemical structures, morphologies and thermal properties of the polymers were determined and the results were compared). Optical fibers were produced using these polymers and they were characterized in terms of their mechanical and optical properties.