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A Study on Polymer Nanocomposites Formation, and Characterization

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Abstract: *Polymer nanocomposites are used in the biomedical, sports, packaging, and automotive industries due to their exceptional property combinations and unique design possibility. Consequently, the preservation of these property gains has raised awareness of polymer nanocomposites in the scientific and commercial sectors. This work investigates the different methods of distributing and coating fibers with nanofillers to enhance the resulting properties. Unlike composites, where density cannot be raised, notable improvements in properties can be achieved with a 1%–5% loading of nanoparticles. According to study, elastomers' modulus, strength, durability, toughness, and gas barrier can all be enhanced by adding different types of nanoreinforcements. Layered silicate clays, carbon nanotubes, nanofibres, and silica nanoparticle nanocomposites are a few examples of these nanoreinforcements. In addition, they exhibit high surface to volume ratios, high aspect ratios, and intercalation/exfoliation properties. They are environmentally beneficial in addition to enhancing characteristics. Despite their many benefits, one of the biggest challenges will be generating them in a suitable number and quality.*

Keywords: nanocomposites, formation, characterization

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