**Development and characterization of new biocomposite based on PTFE, TiO2 and *Luffa cylindrica* fibers**

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**Abstract**

The current research focuses on the use of *Luffa Cylindrica* fibers as a reinforcing agent in a fluoroplastic polymer matrix (PTFE) and TiO2 nanoparticles as a photocatalytic agent in various mass fractions (percentage) for the development and physical characterization of new biocomposite materials. The three sample configurations are PTFE, TiO2, *LC* = (65 : 5 : 30), (70 : 5: 25), and (60: 5: 35) % (in terms of mass fraction). Dynamic light scattering and laser Doppler velocimetry are used to determine the granulometry and zeta potential. Then, the structural and vibrational properties of the PTFE/TiO2/*LC fiber* composites are both characterized by micro-Raman spectroscopy in an oblique backscattering configuration and FTIR spectroscopy. Finally, thermal properties are investigated using TGA and DSC. Among all the tested mass fractions, sample 2 (70% PTFE : 5% TiO2 : 25% *LC*) offers the most interesting characteristics with a reasonable stability of colloidal dispersion and thermal degradation.

The next step in this work will be the characterization of this new biocomposite in terms of mechanical and tribological properties.

Keywords : luffa cylindrica, biocomposite, thermal degradation, PTFE, TiO2.