

## Biodegradation Study of a Biocomposite Material Based on Sunflower Oil and Alfa Fibers as Natural Resources

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**Abstract :** The natural resistance to biodegradation of polymeric materials prepared from petroleum-based source and the management of their wastes in the environment are the driving forces to replace them by other biodegradable materials from renewable resources. For that, in this work new biocomposites materials have been synthesis from sunflower oil (*Helianthus annuus*) and alfa plants (*Stipatenacissima*) as natural based resources. The sunflower oil (SFO) was chemically modified via epoxidation then acrylation reactions to obtain acrylated epoxidized sunflower oil resin (AESFO). The AESFO resin was then copolymerized with styrene as co-monomer in the presence of boron trifluoride (BF<sub>3</sub>) as cationic initiator and cobalt octoate (Co) as catalyst. The alfa fibers were treated with alkali treatment (5% NaOH) before been used as bio-reinforcement. Biocomposites were prepared by mixing the resin with untreated and treated alfa fibers at different percentages. A biodegradation study was carried out for the synthesized biocomposites in a solid medium (burial in the soil) by evaluated, first, the loss of mass, the results obtained were reached between 7.8% and 11% during one year. Then an observation under an optical microscope was carried out, after one year of burial in the soil, microcracks, brown and black spots were appeared on the samples surface. This results shows that the synthesized biocomposites have a great aptitude for biodegradation.

**Keywords :** alfa fiber, biocomposite, biodegradation, soil, sunflower oil

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