

Carbon fibre (obtained from chicken feathers) reinforced bio-composites with soy resin.

*¹D. D. Belarmino,¹R. Ladchumananandasivam, ¹S. M. B. de Andrade, ¹A. O. Galvão
¹Universidade Federal do Rio Grande do Norte, Natal, RN, Brasil*

Biodegradable materials are suitable for various applications and can be developed from soybean oil and fibres from chicken feathers. The present work is innovative in respect to the manufacture and evaluation of carbon fibres from chicken feathers and their use as reinforcement in the fabrication of a bio-composite with soy oil resin. The precursor for the manufacture of carbon fibers was obtained from local poultry industry. The carbon fibres were obtained by pyrolysis of the chicken feathers. In this process, the selected fibres were subjected initially to 240 °C and then at 400 °C to complete the carbon-carbon bonds. The fibres thus obtained are lightweight and have higher mechanical strength. The resin is soy-based triglycerides on providing the required properties of stiffness and strength. The resin was donated by INBRA Chemical Industry Ltd. The resin was mixed with carbon fibers for the manufacture of the biopolymer and was subjected to cold compression molding (SMC). Fracture analysis of the samples was carried out. For morphological studies SEM micrographs were obtained. The development of this work will contribute to the production of new and renewable materials for sustainable economy and benefits the environment.

key words: chicken feather, carbon fibre, soy-oil resin, biocomposite and environment.

[1] CHANG, K. H.; Richard, P. W. Development of a Bio-Based Composite Material from Soybean Oil and Keratin Fibers. *J. Appl. Polym. Sci*, Vol. 95, 2005.

[2] LIU, K. Soybeans: Chemistry, Technology, and Utilization, Chapman & Hall, New York; 1997, pp. 25-95.

[3] TZENG, S.S.; Chr, Y.-G. Evolution of Microstructure and Properties of Phenolic Resin- Based Carbon/Carbon Composites During Pyrolysis, *Mater. Chem. Phys.* 2002, 73, 162-169.

Corresponding author:

debelarmino@yahoo.com.br

Universidade Federal do Rio Grande do Norte – UFRN

Centro de Tecnologia - CT - Av. Senador Salgado Filho, 3000

Lagoa Nova - Campus Universitário - Natal-RN - 59078-970 – Brasil