Accepted Manuscript

Effect of crystallinity on CF/PPS performance under weather exposure: Moisture, salt fog and UV radiation

Natassia L. Batista, Mirabel C. Rezende, Edson C. Botelho

PII: S0141-3910(18)30077-6

DOI: 10.1016/j.polymdegradstab.2018.03.008

Reference: PDST 8482

To appear in: *Polymer Degradation and Stability*

Received Date: 10 October 2017

Revised Date: 30 January 2018

Accepted Date: 11 March 2018

Please cite this article as: Batista NL, Rezende MC, Botelho EC, Effect of crystallinity on CF/PPS performance under weather exposure: Moisture, salt fog and UV radiation, *Polymer Degradation and Stability* (2018), doi: 10.1016/j.polymdegradstab.2018.03.008.

Effect of crystallinity on CF/PPS performance under weather exposure: moisture, salt fog and UV radiation

Natassia L. Batista[1,2*], Mirabel C. Rezende[3], Edson C. Botelho[2]

1 Department of Mechanical Engineering, McGill University, 817 Sherbrook Street West, Montreal, QC H3A 0C3, Canada

2 Department of Materials and Technology, UNESP, Av. Ariberto Pereira da Cunha, 333, Guaratingueta, SP, Brazil

3 Institute of Science and Technology, UNIFESP, R. Talim, 330, Sao Jose dos Campos, SP, Brazil

ABSTRACT

The crystalline content of a composite can affect its performance under environmental conditions. The objective of this study is to evaluate the influence of the crystallinity degree of CF/PPS composites to hygrothermal, salt fog and ultraviolet/condensation conditioning. DSC and DMA results, and Young's modulus and ILSS values were used to evaluate the changes in the thermal and mechanical properties of CF/PPS composites after conditioning. The crystallinity degree showed to affect the water uptake and the severity of degradation. Differences up to 40% were found among the mechanical properties values depending on the crystallinity. In the hygrothermal and salt fog conditioning the least crystalline laminates were mostly degraded. In contrast, in the ultraviolet/condensation conditioning the composites with the highest crystalline contents were more affected.

Keywords: Carbon fibers; Polymers; Environmental degradation; Crystallinity.

* Corresponding author

E-mail address: natassia_lb@hotmail.com (N. L. Batista)