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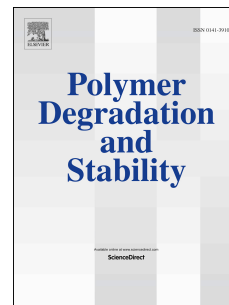
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# Model for Thermal Degradation of Carbon Fiber Filled Poly(Ether Ether Ketone)

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## Abstract

APC-2 is a carbon fiber filled poly(ether ether ketone) (PEEK), it is a composite used mainly for aeronautical applications. It can be processed with an automated tape placement process and the material can be melted with a laser. The laser is powerful and can easily degrade the material. Experiments were performed on APC-2 using different laser irradiances and different exposure durations. Degradation was determined using infrared spectroscopy. A new peak which appeared after the experiments is directly linked to the degradation process. A good agreement was found with previous works published in the literature. A model was developed to calculate the degree of degradation after heating. It was validated with experiments and data from the literature.

*Keywords:* thermal degradation, model, PEEK, carbon fiber, laser

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## 1. Introduction

Parts for aeronautic applications must have very high performances but must also be produced at a reasonable price and be recyclable. High Tech thermoplastic reinforced with High Tech continuous fibers (for example PEEK filled with carbon fibers) can achieve high performances. The total cost is mainly impacted by the price of the material but also by the processes used

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