

Production of Carbon Nanofilaments from Waste Streams and Their Use as Polymers Additives

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Many waste streams remain still unexploited due to their inherent heterogeneity which renders their recycling and reuse techno-economically non-viable.

This work presents a recent process R&D aimed at (1) chemically homogenizing such waste streams by means of an auto-thermal pyrolysis, then, (2) using the resulting carbon and hydrogen-rich product to produce filamentous nanocarbons (CNF) by means of a patented catalytic dry reforming process.

Since the proposed pyrolytic process is autothermal and it produces an excess of gaseous fuel which is used to provide the energy required in the endothermic dry reforming step, the whole process is energetically self-sustained. Moreover, the use of CO₂ in the dry reforming step contributes in decreasing the overall GHG output.

The final product (CNF) is tested with success as additive in polymeric material.