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Abstract Formulary

Presentation type: **Oral** ✔ **Poster** ☐

Title: Plastic packaging waste for reinforcement of silica aerogels

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ABSTRACT (Space limited to 2200 characters)

Plastic water and soda bottles are a common waste that often ends up in the environment and are a cause for serious concerns due to the generation of microplastics. Since these materials are not biodegradable, living creatures are exposed to this waste over long times. To mitigate this problem, bottle producers are now using recycled plastics in the fabrication process, closing the cycle of the produced polymers. However, this recovery is limited, so even the recycled product eventually becomes waste.
In this context, the development of new value-added products with long service life from the end-of-life plastic bottles is one way to drain this waste. Thus, the aim of the present study is to use the aformentioned wastes to reinforce aerogels, contributing to the reduction of environmental pollution. The wastes are preprocessed by an environmentally friendly process that allows them to be used for polymer reinforcement of silica aerogels. In addition, the plastic bottle wastes can also be used to produce fibers by electrospinning, the latter being the reinforcement phase of these aerogels. The obtained aerogels, produced either from TEOS or TEOS/VTMS precursors, were fully characterized, and showed a significant improvement in their mechanical properties.
The approach followed not only contributes to the reintegration of waste into valuable products for the market, but also enables the provision of a more durable thermal insulation material, which in turn can promote the achievement of EU energy efficiency directives in the short term.

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