

## Influence of the operation conditions in the preparation of carbon nanofibers-based aerogels

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Aerogel has become one of the most interesting materials to scientists due to its unique physical and chemical properties that give it the possibility to improve technologies in several fields. In particular, aerogels offer the lowest density and the lowest thermal conductivity of any known solid. Aerogel is a very light material, derivative of a gel, in which the liquid compound has been replaced for a gas. This characteristic provides to the material of a great porosity.

Carbonaceous nanomaterials are employed as reinforcements to form carbon-reinforced composites [1]. Carbon nanofibers (CNFs) and graphene oxide (GO) exhibit outstanding physical and mechanical properties, including high surface to volume area, high Young's modulus, low coefficient of thermal expansion and an entangled structure. The carbonaceous nanomaterials improve the mechanical properties of the organic aerogels. The technique selected for the synthesis of aerogels was sol-gel method. Fig. 1 shows the synthesis steps of carbon nanofibers-based aerogels.

In this work, the preparation of carbon nanostructured-reinforced aerogels was carried out using a freeze-drying method. Furthermore, the influence of the operation conditions in the performance of the freeze-drying method (temperature, pressure and time) was studied.

### References

1. S. C. Tjong, Mat. Sci. Eng. R., **74**, 281 (2013).

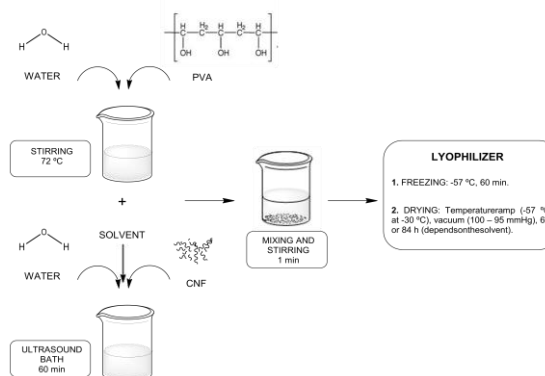


Fig.1. Schematic representation of the synthesis of carbon nanofibers-based aerogels.