

# Acid Catalyzed Foaming Process For Cyclic Carbonated Containing Foams

**Foams, Organocatalysis, Bio-based Foams, Cyclic carbonate, Acid Catalysed Foaming Process**

## TYPE OF DEVELOPMENT

Development of sustainable materials.

## DESCRIPTION

The invention aims to improve self-blowing formulations for creating high-quality foams of varying densities using cyclic carbonates. The technology introduces a vinyl ether to decrease viscosity and a catalyst for the crosslinking reaction, ensuring the foaming process meets industrial criteria. It also allows for a single-step functionalization of foams, combining foaming and crosslinking with precise chemical modification.

The process uses low-cost, non-toxic reagents, low to moderate temperatures, and controlled blowing agent generation. The technology allows for precise functionalization of hydroxyl pending groups, reducing hydrophilicity and plasticizing effects. The formulation with multifunctional vinyl ether can yield closed cell foams for various applications, including insulation and soundproofing.

## INDICATION

Sustainable foaming technology improves construction, packaging and consumer products.

## NOVELTY/ADVANTAGES

Foam materials are versatile and can be customized for various applications. However, their production relies on nonrenewable resources and toxic chemicals like isocyanate and phosgene. These chemicals are used in isocyanate-based polyurethane (PU) foams, which dominate the market. This process has environmental and health concerns.

A greener alternative is the synthesis of non-isocyanate polyurethanes (NIPUs) through copolymerization of bicyclic carbonate monomers and diamines. This method offers a low-cost, non-toxic reagent, controlled blowing agent generation, and improved mechanical properties, including closed-cell structures for thermal insulation and lightweight structural components.

Reference:

Vinyfoalms



## Research group:

Sustainable Polymer Materials for advanced applications

## Main researcher:

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## IPR STATUS

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21/11/2024

**Applicant:** University of the Basque Country (EHU)/ University of Liege / University of Mons.

## COOPERATION GOAL

Company interested in the license and Industrial collaboration.