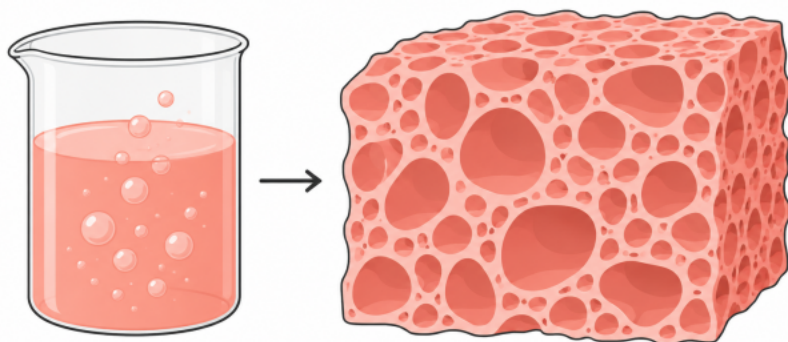


A new route to **polymer foams**

Isocyanate-free foaming with
amino acid-derived blowing agents



Haritz Sardon Muguruza

WO2026201974 A1



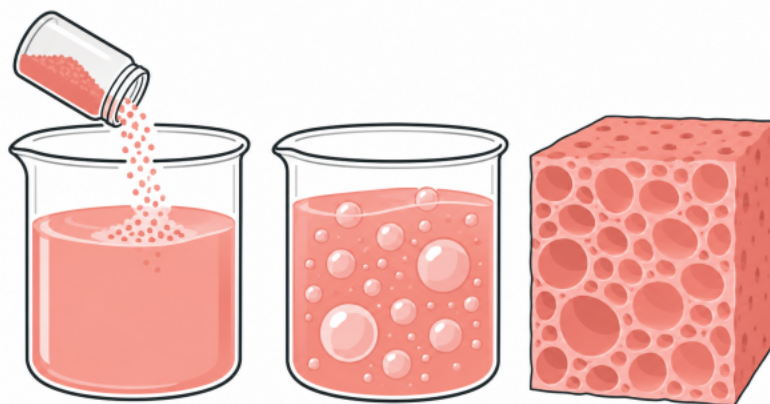
Guillem Seychal



Gabriel Perli

Foam forms from within

Gas generation and polymer formation work together.



1 Add the blowing agent

Amino acid-derived NCAs are added at 1–3 wt% in the formulations presented by the team.

2 Generate CO₂ in situ

The NCAs react to release carbon dioxide directly inside the polymer mixture.

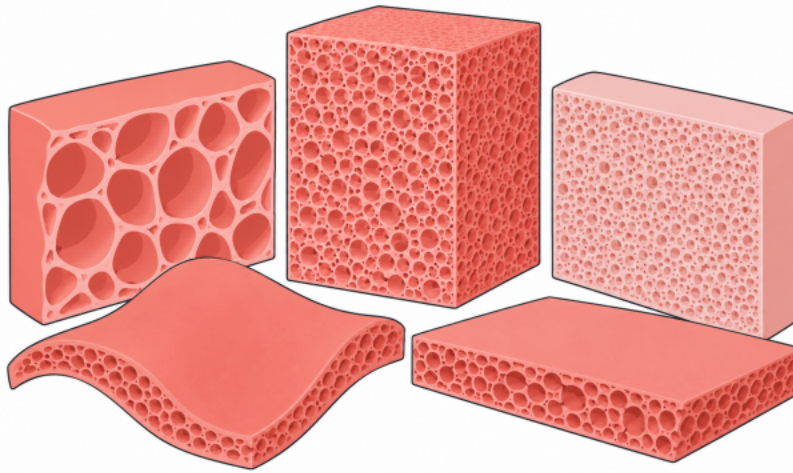
3 Create a cellular structure

Gas bubbles form while the polymer network develops, producing a foam.

WO2026201974 A1

One approach. Multiple resins.

Foaming explored across five resin families.



Epoxies

Polyesters

Polyurethanes

Polycarbonates

Polyamides

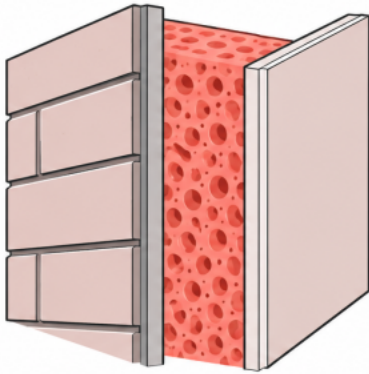
Tune density, pore size and thermal response.

Properties depend on resin and formulation.

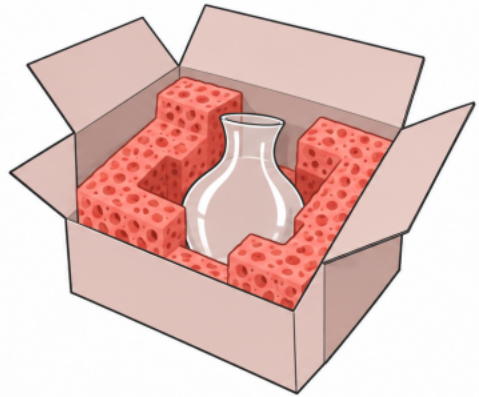
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From chemistry to new possibilities

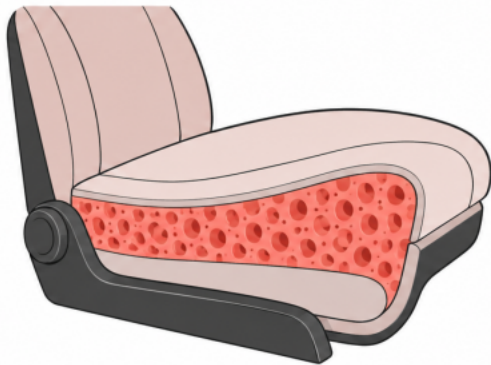
Potential uses for tailored polymer foams



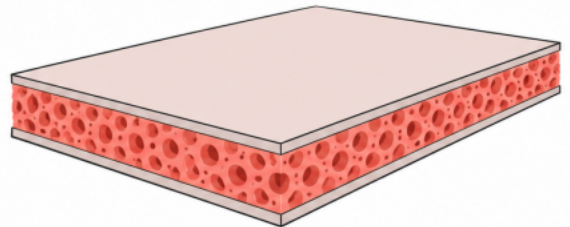
Insulation



Protective packaging



Automotive components



Lightweight panels

WO2026201974 A1