Scientist from university of Wisconsin-Madison (USA) and South China university of Technology collaborated to develop a ***new microcellular process for polycarbonate (PC) using water as the physical blowing agent***
.

Water is not a new blowing agent to polymer scientists. It has been used both as a chemical blowing agent as well as physical blowing agent to make polyurethane foam. The main issue that a molder encounters is the surface imperfections (roughness). Roughness arises from released gas (from super critical nitrogen or carbon dioxide) from the melting polymer and from the rate of cell nucleation.

In this work, authors used a commercial grade PC (Lexan 141), water and salt (sodium chloride) to make microcellular polycarbonate part. A typical injection molding machine was used. Authors claimed that the solution dispensing valve and meter on the top of typical injection molding hopper is simpler and cost-effective than a commercial microcellular injection unit. A weight reduction of ~10% is easily obtained. The PC part using salt solution provided smooth surface comparable to that of solid PC surface
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Advances in microcellular injection molding process appear to be heating up again.

Reference: J. Peng, L-S. Turng, and X-F. Peng; ***Polym Eng. Sci.***, 52, pp 1464-1473 (**2012**). DOI: 10.1002/pen.23092