

## **ELEGANT METHODS FOR PREPARING EPOXY FOAMS**

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Their excellent weight-to-performance ratio is a major reason for the unwaning interest in macroporous polymers. They are applied as cores in composite sandwich structures, insulation and packaging materials, scaffolds in tissue engineering and as filters in separation applications. Furthermore, the substitution of metal parts by low weight materials is an important step towards ‘greener’ means of transport.

Combining emulsion templating with epoxies, which are manifold in their properties and versatile in processing, provides an elegant way to produce porous epoxy foams. The beauty of this method is the ability of controlling a material’s properties simply by adjusting the emulsification process and formulation.

The preparation of porous epoxies, cured through a polyaddition reaction, shows the wider applicability of emulsion templating, which in the past was mainly restricted to radical polymerization. By varying internal phase ratio and amount of surfactant, polyMIPes (polymerized Medium Internal Phase Emulsions), with regulated properties, such as pore size, porosity and permeability, could be prepared.

Moreover, we have developed a straight forward method to produce porous epoxy polymers out of powder-only compounds. The transformation of a mixture of epoxy resin, hardener and accelerator into a closed-cell epoxy foam was initiated solely by applying heat.