

CATIONIC FRONTAL POLYMERIZATION - FIT FOR INDUSTRIAL APPLICATIONS?

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Radical Induced Cationic Frontal Polymerization (RICFP) is a cationic ring-opening polymerization applicable for different industrially relevant resins like epoxides or vinyl ethers. Therein, a local stimulus triggers a self-sustaining and propagating curing “wave” throughout the whole resin. This makes it a faster and more energy-efficient curing method than the state of the art.

Although the principle is already well-established in academia, with the recent advances in this field towards particle filled systems and composites, different industries have shown interest in frontal polymerization.

Herein, we present the concept behind cationic frontal polymerization with its possibilities, limitations and feasible adaptations towards industrial applications. The scope will illustrate the evolution from unfilled systems towards composites and the application in filament winding of tanks.

Speakers Biography

Markus Fitzka studied technical chemistry at TU Wien with a specialization in polymer chemistry during his master studies. He did his master thesis in the group of Robert Liska under the supervision of Stefan Baudis with the title “A systematic study on self-reinforcing thermoplastic urethane/urea elastomers”. In 2021, he rejoined the group and started his PhD thesis under the supervision of Patrick Knaack and Robert Liska. Currently, he is working on the project “Rapid and energy-efficient Production of Carbon-Fiber Reinforced Polymers” (REEP CFRP) dealing with the application of Radical Induced Cationic Frontal Polymerization (RICFP) towards new possibilities in composite production.