

- o Long pot life from microencapsulated components
- o Rapid Curing

- o One pot formulation
- o Photo or thermally initiated
- o Unlimited depth of cure

INTRODUCTION

Composites are traditionally cured by using a two-part formulation that reacts upon mixing or by using an autoclave to cure the formulation at high temperature. The disadvantage is that once the components are mixed, the system begins reacting.

OUR PROCESS

Frontal polymerization is a self-propagating localized reaction that allows rapid curing without any intrinsic limits to the size of the sample and without continuous expenditure of energy. Figure 1 shows a schematic of the propagating front. Fronts with free-radical polymerization propagate with velocities from 1-20 centimeters per minute.

Our technology is suitable for a variety of chemistries including epoxies, ring opening metathesis, thiolene, free-radical polymerization and interpenetrating polymer networks.

Pot lives of days to weeks can be easily achieved with patent pending microencapsulation techniques. By microencapsulating an initiator is kept sequestered from the monomer. Upon exposure a heat source, the capsule bursts open to initiate frontal polymerization.

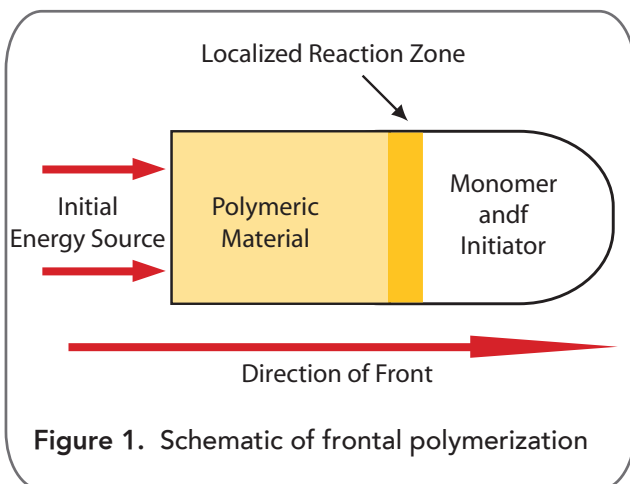


Figure 1. Schematic of frontal polymerization

APPLICATIONS

Frontal polymerization techniques are particularly suited to applications that require "in-situ" and/or rapid cure.

OPPORTUNITIES

The patent-pending polymerization systems described above are ready for immediate licensing.

With the available resources of the University of Southern Mississippi Department of Chemistry and Biochemistry, we also offer research capabilities to develop a custom system to meet your specific performance needs or investigate frontal polymerization in alternative polymer systems and applications.

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