Frontal Polymerization—Quo Vademus?

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Frontal polymerization is a process in which a localized reaction zone propagates from the coupling of thermal transport and the Arrhenius dependence of the reaction rate of an exothermic polymerization. We will review the origins of frontal polymerization and review the chemistries that can be used and the convective and thermal instabilities that arise. We consider the applications to autoclaveless manufacturing of composites. Specific applications to "cure-on-demand" materials will discussed. We will explore the commercialization of "QuickCure Clay" for the arts and crafts market and QuickCure WoodFiller and consider how frontal polymerization can be used for additive manufacturing and coatings. Finally, we consider future opportunities and challenges for further commercial application of frontal polymerization.

Dr. John A. Pojman, a native of North Royalton, Ohio, received his B. S. in Chemistry (with a minor in Classics) from Georgetown University in 1984. He earned his doctorate in Chemical Physics in 1988 at the University of Texas at Austin. Pojman then worked for two years at Brandeis University with Irving Epstein. In 1990 he joined the Chemistry & Biochemistry department at The University of Southern Mississippi, where he taught for 18 years. Dr. Pojman joined the Department of Chemistry at Louisiana State University in August 2008, where he is the Patricia Senn and William Senn, Jr., Distinguished Professor.

Pojman co-authored one monograph, An Introduction to Nonlinear Chemical Dynamics, and co-edited two others. He has served four times as a guest editor for the journal Chaos and authored 191 peer-reviewed publications and ten book chapters. Over his academic career, he made 315 presentations and received six patents. Since 1990 he supervised 195 undergraduates. His research expertise is in nonlinear dynamics in polymer systems and materials of art. Additionally, he is an avid bass fisherman, trout fisher and amateur herpetologist with a special interest in the aquatic salamanders of Louisiana (http://amphiumas.org). He also boasts the world largest collection of pocket protectors. www.pocketprotectors.info. John is the President and 3PCEO of Pojman Polymer Products, LLC (3pllc.com).

He lives in Baton Rouge, Louisiana with his wife, Dionne Rousseau.