

# **TIME-LAPSE AND CURE-ON-DEMAND POLYMERIZATIONS FOR ADHESIVES, WOOD REPAIR AND ART**

John A. Pojman

Department of Chemistry, Louisiana State University, Baton Rouge, LA, 70803, USA

The goal of cure-on-demand polymerization is to create one-pot systems that have a long shelf life but will react rapidly when curing is desired. We use two approaches: coupling polymerizations with clock reactions and an approach called frontal polymerization 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 demonstrate that frontal polymerization can be used to create a cure-on-demand putty for filling holes in wood, marble, and sheet rock. The putty has a months-to-years shelf life, is a one-pot formulation, can be applied leisurely and then cured rapidly with a flat heat source. We also demonstrate frontal polymerization can be used to create an adhesive for wood and plastic-wood composites that cures rapidly and has impressive shear strength. Finally, we will explore current efforts to commercialize “3P QuickCure Clay” for the art market.