# Modeling of Methyl Methacrylate Polymerization Using MATLAB

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**ABSTRACT**

This paper presents a modeling of methyl methacrylate (MMA) polymerization with toluene in the presence of azo-bi's-isobutyronitrile (AIBN) using MATLAB. This work aims to optimize the initial concentration of initiator and the reactor temperature to achieve a maximum monomer conversion in minimum batch time. The optimization of solution polymerization of MMA based on the three-stage polymerization model (TSPM) was performed using ode23t solver. The non-linear polymerization kinetics considered the gel, glass and cage effect to obtain a realistic prediction. The predicted reactor and jacket temperature showed a reasonable agreement with the experimental data, where the error is about 2.7 % and 2.3 %, respectively. The results showed that a maximum monomer conversion of 94 % was achieved at 0.126 kgmol m$^{-3}$ of the initial concentration of AIBN and 346 K of the initial reactor temperature in 8,951 s (2.5 h).