**Mathematical modeling of the copolymerization of styrene with dimethacrylates**

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**Abstract**

A mathematical model for the solution copolymerization of styrene with dimethacrylates. The approach is able to predict the post-gelation period and it comprises diffusion effects and cyclization reactions. The numerical fractionation method, balance of sequences and pseudo-homopolymerization hypothesis were used in the description. Diffusion effects were taken into account through an exponential correlation between the termination rate coefficient and the monomer conversion. Average rate coefficients of cyclization and cross-linking reactions were fitted. The model was validated through literature data on copolymerizations of styrene with ethylene glycol dimethacrylate, and styrene with tetraethylene glycol dimethacrylate. The predictions were satisfactory in the range of 1 – 20 % of dimethacrylate and temperature at 95°C.

**Keywords**: styrene, dimethacrylate, model, copolymerization