Free Radical Polymerization

Kinetics of Multifunctional Initiator Systems

Multifunctional initiators are defined as the free radical initiators that have at least two labile groups having same or different thermal decomposition characteristics. For the application of such multifunctional initiators in industrial free radical polymerization processes, it is necessary to understand the kinetics of polymerization. However, the presence of additional labile group(s) makes the modeling of polymerization kinetics quite complicated. In our papers, we have developed the detailed kinetic models for bifunctional initiator systems and used the models for the analysis of polymerization reactors.

1. Modeling of free radical polymerization of styrene by bifunctional initiators (K.Y. Choi and G.D. Lei), **A.I.Ch.E.J**., 33(12), 2067-2076 (1987).
2. Steady state behavior of a continuous stirred tank reactor for styrene polymerization with bifunctional initiators (K.Y. Choi and K.J. Kim), **Chem. Eng. Sci**., 43(4), 965-977 (1988).
3. Kinetics of bulk styrene polymerization catalyzed by symmetrical bifunctional initiators (K.Y. Choi, W.R. Liang and G.D. Lei), **J. Appl. Polym. Sci**., 35, 1547-1562 (1988). Modeling of free radical polymerization of styrene by unsymmetrical bifunctional initiators (K.Y. Choi and K.J. Kim), **Chem. Eng. Sci**., 44(2), 297-312 (1989).
4. Bulk free radical polymerization of styrene with unsymmetrical bifunctional initiators (K.J. Kim, W.R. Liang and K.Y. Choi), **Ind. Eng. Chem. Res**., 28, 131-138 (1989).
5. Kinetics of free radical styrene polymerization with a symmetrical bifunctional initiator 2,5-dimethyl-2,5-bis(2-ethyl hexanoyl peroxy) hexane (W.J. Yoon and K.Y. Choi), **Polymer**, 33(21), 4582-4591 (1992).
6. Free radical polymerization of styrene with a binary mixture of bifunctional initiators (W.J. Yoon and K.Y. Choi), **J. Appl. Polym. Sci**., 46, 1353-1367 (1992).