

Volume 7

## Molecular Weight Distribution of Polystyrene Produced in a Starved Feed Reactor

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收稿日期 1998-2-26 修回日期 网络版发布日期 接受日期 1999-3-17

**摘要** A starved feed reactor (SFR) is a semi-batch polymerization reactor where initiator and monomer are fed slowly into a fixed amount of solvent. The polymerization is carried out isothermally at elevated temperatures. The added initiator decomposes instantaneously and the added monomer polymerizes immediately. The molecular weight (MW) and molecular weight distribution (MWD) of the product polymer can be effectively controlled by the feed ratio of monomer to initiator. This paper presents a study on the MWD of styrene polymerization in a SFR. The MWD model parameters are regressed with experimental data. Although the solids fraction in the SFR is high (higher than 50%), viscosity is not too high and the "gel effect" is weak due to the low molecular weight of the products. It is found that the termination rate constant is a power function of molecular weight, radicals terminate via 100% combination, the thermal initiation can be neglected even at high reaction temperature studied. And calculated results indicate that in the SFR, the validity of the long chain assumption becomes doubted. It appears that other alternative assumption should be found for an improved model.

**关键词** [starved feed reactor](#) [molecular weight distribution](#) [styrene](#) [radical polymerization](#)

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Received 1998-2-26 Revised Online Accepted 1999-3-17

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**Key words** [starved feed reactor](#); [molecular weight distribution](#); [styrene](#); [radical polymerization](#)

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