

Accepted Manuscript

Title: Monte-Carlo-Simulation-based Optimization for Copolymerization Processes with Embedded Chemical Composition Distribution

Authors: Yannan Ma, Xi Chen, Lorenz T. Biegler



PII: S0098-1354(17)30419-2
DOI: <https://doi.org/10.1016/j.compchemeng.2017.11.018>
Reference: CACE 5962

To appear in: *Computers and Chemical Engineering*

Received date: 31-5-2017
Revised date: 19-11-2017
Accepted date: 20-11-2017

Please cite this article as: Ma, Yannan., Chen, Xi., & Biegler, Lorenz T., Monte-Carlo-Simulation-based Optimization for Copolymerization Processes with Embedded Chemical Composition Distribution. *Computers and Chemical Engineering* <https://doi.org/10.1016/j.compchemeng.2017.11.018>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Monte-Carlo-Simulation-based Optimization for Copolymerization Processes with Embedded Chemical Composition Distribution

Yannan Ma^a, Xi Chen^{a*}, Lorenz T. Biegler^b

^a *State Key Laboratory of Industrial Control Technology, College of Control Science and Engineering,
Zhejiang University, Hangzhou, 310027, China*

^b *Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA 15213, USA*

* Correspondence concerning this article should be addressed to Xi Chen at xi_chen@zju.edu.cn.

Highlights

- Monte Carlo simulation is designed in a parallel way on the graphics processing unit (GPU) platform.
- An adaptive algorithm is proposed to reduce computational cost based on error estimation of the Monte Carlo simulation.
- A successive boundary shrinkage formulation is developed to improve the convergence of the optimization.
- Monte-Carlo-Simulation-based optimization is conducted for copolymerization processes with embedded chemical composition distribution.

Abstract:

As chemical composition distribution (CCD) is a crucial microstructural quality index of copolymers, optimization of operating policies using CCD is of great importance. Monte Carlo simulation is an efficient method to calculate the CCD that cannot be easily determined by traditional equation-based methods. But this method is computationally expensive. In this project, we first propose a parallel technique to conduct the Monte Carlo simulation on the graphics processing unit (GPU) platform.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات