

# Accepted Manuscript

Modulating the mean residence time difference of wide-size particles in a fluidized bed

Hu Zhao, Jun Li, Qingshan Zhu, Hongzhong Li

PII: S1004-9541(17)30475-5  
DOI: doi:[10.1016/j.cjche.2017.06.018](https://doi.org/10.1016/j.cjche.2017.06.018)  
Reference: CJCHE 859

To appear in:

Received date: 21 April 2017  
Revised date: 12 June 2017  
Accepted date: 16 June 2017

Please cite this article as: Hu Zhao, Jun Li, Qingshan Zhu, Hongzhong Li, Modulating the mean residence time difference of wide-size particles in a fluidized bed, (2017), doi:[10.1016/j.cjche.2017.06.018](https://doi.org/10.1016/j.cjche.2017.06.018)

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.



## Fluid Dynamics and Transport Phenomena

### Modulating the mean residence time difference of wide-size particles in a fluidized bed

ZHAO Hu (赵虎)<sup>a, b</sup>, LI Jun (李军)<sup>a, \*\*</sup>, ZHU Qingshan (朱庆山)<sup>a, b, \*\*</sup>, and LI Hongzhong (李洪钟)<sup>a, b</sup>

<sup>a</sup> State Key Laboratory of Multiphase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China

<sup>b</sup> University of Chinese Academy of Sciences, Beijing 100049, China

**Abstract:** For non-catalytic gas-solid reaction, it is desirable to match the mean residence time (MRT) of particles and complete conversion time ( $t_c$ ) in a fluidized bed. In this study, the MRT differences (MRT ratios) between the coarse particles and the fine particles were investigated in a continuous fluidized bed with a side exit by varying the superficial gas velocity, feed composition and particle size ratio. The results show that the MRT ratio increases firstly and then decreases with increasing the gas velocity. By controlling the gas velocity and the feed composition of coarse particles, the MRT ratio can be modulated from 1.8 to 10.5 at the gas velocity of 1.0m/s for the binary mixture with the size ratio of 2.2. The MRT ratio can reach to ~12 at the gas velocity of 1.2m/s for the particles size ratio of 3.3. The present study has endeavored to obtain fundamental data for an effective plant operation to meet the need of synchronously complete conversion of particles with different sizes during the film diffusion controlling reaction.

**Keywords:** fluidized bed; mean residence time; wide size distribution; binary mixture;

---

\* Supported by the China National Funds for Distinguished Young Scientists for the financial support (21325628), National Natural Science Foundation of China (91334108) and the State Key Laboratory of Multiphase Complex Systems, Institute of Process Engineering, Chinese Academy of Sciences (No. MPCs-2012-A-02 and MPCs-2014-A-03).

\*\* Corresponding author: qszhu@ipe.ac.cn (Q. Zhu), junli@ipe.ac.cn (J. Li)

Download English Version:

<https://daneshyari.com/en/article/6593104>

Download Persian Version:

<https://daneshyari.com/article/6593104>

[Daneshyari.com](https://daneshyari.com)