

Accepted Manuscript

Hydrodynamics of descending gas-liquid flows in solid foams: Liquid holdup, multiphase pressure drop and radial dispersion

Johannes Zalucky, Michael Wagner, Markus Schubert, Rüdiger Lange, Uwe Hampel

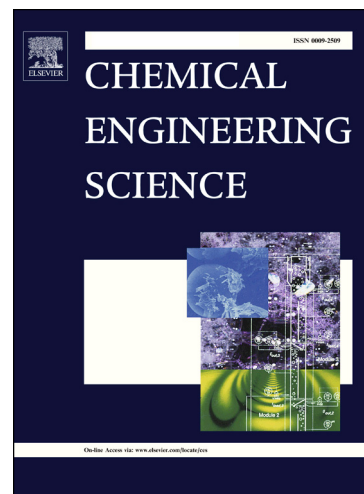
PII: S0009-2509(17)30323-8
DOI: <http://dx.doi.org/10.1016/j.ces.2017.05.011>
Reference: CES 13598

To appear in: *Chemical Engineering Science*

Received Date: 22 December 2016
Revised Date: 19 April 2017
Accepted Date: 6 May 2017

Please cite this article as: J. Zalucky, M. Wagner, M. Schubert, R. Lange, U. Hampel, Hydrodynamics of descending gas-liquid flows in solid foams: Liquid holdup, multiphase pressure drop and radial dispersion, *Chemical Engineering Science* (2017), doi: <http://dx.doi.org/10.1016/j.ces.2017.05.011>

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.



Hydrodynamics of descending gas-liquid flows in solid foams: Liquid holdup, multiphase pressure drop and radial dispersion

Johannes Zalucky^a, Michael Wagner^b, Markus Schubert^{a,*}, Rüdiger Lange^c, Uwe Hampel^{a,b}

^a*Institute of Fluid Dynamics, Helmholtz-Zentrum Dresden-Rossendorf, Bautzner Landstraße 400, 01328 Dresden, Germany*

^b*AREVA Endowed Chair of Imaging Techniques in Energy and Process Engineering, Technische Universität Dresden, 01062 Dresden, Germany*

^c*Chair of Chemical Engineering and Process Plants, Technische Universität Dresden, 01062 Dresden, Germany*

*Corresponding author: m.schubert@hzdr.de

Abstract

In this contribution we report on spatially resolved analysis of multiphase hydrodynamics in solid foam packed trickle bed reactors. For investigation we used ultrafast X-ray computed tomography and fast response pressure transducers. The SiSiC foams' pore density, the liquid distribution system as well as gas and liquid flow rates were varied. The transient behavior of the liquid holdup at trickle and pulse flow as well as after drainage were examined and correlations for static and dynamic holdups were derived. The correlations are based on Eötvös, Reynolds and Galileo number, using porosity and specific area for the definition of the hydraulic diameter. The correlations are applicable to a wide range of foam morphologies, pore densities and operation conditions reported

Download English Version:

<https://daneshyari.com/en/article/4763944>

Download Persian Version:

<https://daneshyari.com/article/4763944>

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