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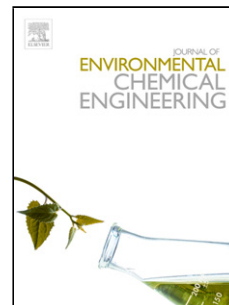
Title: PROCESS ASPECTS OF THREE-PHASE INVERSE FLUIDIZED BED BIOREACTOR: A REVIEW

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PII: S2213-3437(17)30303-2

DOI: <http://dx.doi.org/doi:10.1016/j.jece.2017.06.052>

Reference: JECE 1714



To appear in:

Received date: 4-5-2017

Revised date: 21-6-2017

Accepted date: 30-6-2017

Please cite this article as: Dharmesh H.Sur, Mausumi Mukhopadhyay, PROCESS ASPECTS OF THREE-PHASE INVERSE FLUIDIZED BED BIOREACTOR: A REVIEW, Journal of Environmental Chemical Engineering <http://dx.doi.org/10.1016/j.jece.2017.06.052>

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PROCESS ASPECTS OF THREE-PHASE INVERSE FLUIDIZED BED BIOREACTOR: A REVIEW

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Abstract

Recently, three-phase inverse fluidized bed bioreactor is used for many industrial applications covering problems related to chemical, environmental and biotechnology industries. The studies concerning the process aspects of three-phase inverse fluidized beds are limited. In this paper, the process parameters affecting overall performance of three-phase inverse fluidized bed bioreactors (TPIFBs) are reviewed focusing wastewater treatment. The effects of mass and heat transfer for understanding the hydrodynamic characteristics of the TPIFB are extensively discussed for both- the batch and the continuous modes of operation. The batch mode studies are found to rely mainly on superficial gas velocity. The process aspects for the continuous mode are well investigated, and compared with that of batch mode. In addition, the effects of flow regimes and fluidized bed dimensions are reviewed for its effects on overall performance of TPIFB. The influence of hydraulic retention time, bio-carriers, aspect ratio, superficial gas velocity, superficial liquid velocity, bed expansion and mass transfer characteristics on performance of bioreactor is well focused.

Key words: Three-phase inverse fluidized bed, Batch mode, Continuous mode, Bioreactor

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