

Accepted Manuscript

Title: Characterizing the preparation of a concentrated nutrient feed solution for a large-scale cell culture process

Authors: Brian Russell, Guillermo Miro-Quesada, Limin Qu, Sanjeev Ahuja



PII: S1369-703X(18)30092-5
DOI: <https://doi.org/10.1016/j.bej.2018.03.009>
Reference: BEJ 6912

To appear in: *Biochemical Engineering Journal*

Received date: 19-7-2017
Revised date: 9-3-2018
Accepted date: 10-3-2018

Please cite this article as: Russell B, Miro-Quesada G, Limin Q, Ahuja S, Characterizing the preparation of a concentrated nutrient feed solution for a large-scale cell culture process, *Biochemical Engineering Journal* (2018), <https://doi.org/10.1016/j.bej.2018.03.009>

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.

Characterizing the preparation of a concentrated nutrient feed solution for a large-scale cell culture process

Brian Russell, Guillermo Miro-Quesada, Limin Qu, Sanjeev Ahuja

Cell Culture and Fermentation Sciences, MedImmune LLC
One MedImmune Way, Gaithersburg, MD USA 20878

Correspondence to: Brian Russell, MedImmune, LLC, One MedImmune Way, Gaithersburg, MD 20878.
Ph: 301-398-4287. Email: russellb@medimmune.com

Highlights

- A scale-down model for a feed solution enabled evaluation of key parameters.
- 3L controlled bioreactors were used to model the scale-dependent heat loss.
- Characterization of a nutrient feed solution was demonstrated.

Abstract

Fed-batch mammalian cell culture processes frequently employ concentrated and complex media and feeds during the production phase. Though significant efforts are undertaken to characterize the large-scale bioreactor with respect to its control parameters, similar efforts are not commonly undertaken to characterize the feed preparation process. During the characterization of a commercial cell culture process using elements of Quality-by-Design (QbD) principles, we identified the complex nutrient feed solution preparation as an important step and temperature, mixing time, and mixing intensity were identified as factors impacting this unit operation via a systematic risk assessment. To best simulate the large-scale feed preparation process, a 3L model was developed to determine the impact of the feed preparation conditions. Feed preparation parameters were characterized and the solutions generated were analyzed using various analytical methods, a filterability assessment, and cell culture use tests that included evaluation of culture performance and relevant product quality attributes. Based on the data from the characterization studies, appropriate ranges for an allowable multivariate operating space for large scale feed

Download English Version:

<https://daneshyari.com/en/article/6482215>

Download Persian Version:

<https://daneshyari.com/article/6482215>

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