Accepted Manuscript

Partition coefficient prediction of Baker's yeast invertase in Aqueous Two Phase Systems using Hybrid Group Method Data Handling Neural Network

Carlos Eduardo de Araújo Padilha, Sérgio Dantas de Oliveira Júnior, Domingos Fabiano de Santana Souza, Jackson Araújo de Oliveira, Gorete Ribeiro de Macedo, Everaldo Silvino dos Santos

PII: S1004-9541(16)30416-5
DOI: doi: 10.1016/j.cjche.2016.07.015
Reference: CJCHE 632

To appear in:

Received date: 6 May 2016
Revised date: 3 June 2016
Accepted date: 14 July 2016

Please cite this article as: Carlos Eduardo de Araújo Padilha, Sérgio Dantas de Oliveira Júnior, Domingos Fabiano de Santana Souza, Jackson Araújo de Oliveira, Gorete Ribeiro de Macedo, Everaldo Silvino dos Santos, Partition coefficient prediction of Baker's yeast invertase in Aqueous Two Phase Systems using Hybrid Group Method Data Handling Neural Network, (2016), doi: 10.1016/j.cjche.2016.07.015

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.

ACCEPTED MANUSCRIPT

Partition coefficient prediction of Baker's yeast invertase in Aqueous Two Phase Systems using Hybrid Group Method Data Handling Neural Network

Carlos Eduardo de Araújo Padilha, Sérgio Dantas de Oliveira Júnior, Domingos Fabiano de Santana Souza, Jackson Araújo de Oliveira, Gorete Ribeiro de Macedo, Everaldo Silvino dos Santos*

Laboratory of Biochemical Engineering, Chemical Engineering Department, Federal University of Rio Grande do Norte (UFRN), Natal-RN, Brazil.

Email: everaldo@eq.ufrn.br

Abstract

A hybrid GMDH neural network model has been developed in order to predict the partition coefficients of invertase from Baker´s yeast. ATPS experiments were carried out changing the molar average mass of PEG (1500-6000 Da), pH (4.0-7.0), percentage of PEG (10.0-20.0 w/w), percentage of $MgSO_4$ (8.0-16.0 w/w), percentage of the cell homogenate (10.0-20.0 w/w) and the percentage of $MnSO_4$ (0-5.0 w/w) added as co-solute. The network evaluation was carried out comparing the partition coefficients obtained from the hybrid GMDH neural network with the experimental data using different statistical metrics. The hybrid GMDH neural network model showed better fitting (% AARD = 32.752) of the partition coefficients of the ATPS than the original GMDH network approach and a BPANN model as well as showed good generalization capacity. Therefore hybrid GMDH neural network model appears as a powerful tool for predicting partition coefficients during downstream processing of biomolecules.

Download English Version:

https://daneshyari.com/en/article/4764065

Download Persian Version:

https://daneshyari.com/article/4764065

Daneshyari.com