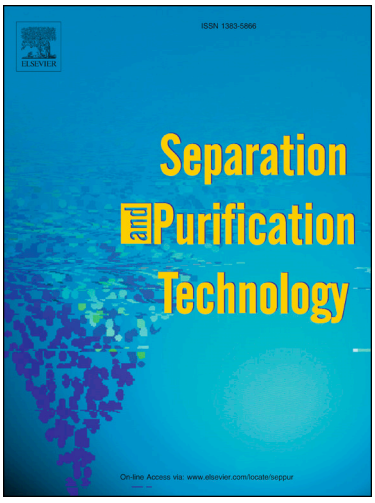

A simplified and general approach to absorption and stripping with parallel streams

Antonio J. A. Meirelles, Lilian C. K. Biasi, Fabio R. M. Batista, Eduardo A. C. Batista

PII: S1383-5866(17)33811-X
DOI: https://doi.org/10.1016/j.seppur.2018.04.004
Reference: SEPPUR 14500

To appear in: *Separation and Purification Technology*

Received Date: 20 November 2017
Revised Date: 20 March 2018
Accepted Date: 1 April 2018

Please cite this article as: A. J. A. Meirelles, L. C. K. Biasi, F. R. M. Batista, E. A. C. Batista, A simplified and general approach to absorption and stripping with parallel streams, *Separation and Purification Technology* (2018), doi: https://doi.org/10.1016/j.seppur.2018.04.004

A simplified and general approach to absorption and stripping with parallel streams

Antonio J. A. Meirelles[a]*, Lilian C. K. Biasi[a]; Fabio R. M. Batista[b]; Eduardo A. C. Batista[a]

a-ExTrAE, Laboratory of Extraction, Applied Thermodynamics and Equilibrium; Department of Food Engineering, School of Food Engineering; University of Campinas – UNICAMP, zip code 13083-862, Campinas, SP, Brazil

b- Department of Chemical Engineering, School of Engineering of Lorena, University of São Paulo - USP, zip code: 12602-810, Lorena, SP, Brazil

* Corresponding author: tomze@unicamp.br

E-mail adresses: tomze@unicamp.br (A.J.A. Meirelles), lilian.biasi@outlook.com (L.C.K. Biasi), fbatista@usp.br (F.R.M. Batista), eacbat@unicamp.br (E.A.C. Batista)

Highlights

Development of McCabe-Thiele methodology for para- and meta-absorption/stripping columns with two or more divisions of the vapor or liquid phases, respectively.

Alternative processes capable of diminishing either the consumption of solvent (absorption)/ stripping agent (desorption) or the equipment height.

Development of Kremser-like equations for para- and meta-absorption/stripping.

Extension of the approach to the calculation of binary distillation columns.

Abstract

This work presents a simplified and general approach for calculating the number of ideal stages and the corresponding concentrations in absorption and stripping with parallel streams. Vapor (gas)/liquid separation processes with parallel streams involve the division of either the vapor phase or the liquid phase in a selected and feasible number of sub-streams and their contact, in alternate trays, with the entire stream of the other phase, i.e. the liquid or vapor phases, respectively. The division of the vapor phase (para-absorption or stripping) allows the possible allocation of a larger number of trays