Prediction of holdup and drop size distribution in a disc-doughnut pulsed column with tenova kinetics internals for the water-Alamine 336 system

Wen Li, Yong Wang, Kathryn A. Mumford, Kathryn H. Smith, Geoffrey W. Stevens

PII: S0304-386X(18)30226-3
DOI: doi:10.1016/j.hydromet.2018.08.017
Reference: HYDROM 4897

To appear in: *Hydrometallurgy*

Received date: 15 March 2018
Revised date: 14 August 2018
Accepted date: 25 August 2018

Please cite this article as: Wen Li, Yong Wang, Kathryn A. Mumford, Kathryn H. Smith, Geoffrey W. Stevens , Prediction of holdup and drop size distribution in a disc-doughnut pulsed column with tenova kinetics internals for the water-Alamine 336 system. Hydrom (2018), doi:10.1016/j.hydromet.2018.08.017

Prediction of Holdup and Drop Size Distribution in a Disc-Doughnut Pulsed Column with Tenova Kinetics Internals for the Water-Alamine 336 System

Wen Li[1], Yong Wang[1], Kathryn A. Mumford[1], Kathryn H. Smith[1], Geoffrey W. Stevens[1,*]

[1]Department of Chemical Engineering, The University of Melbourne, Parkville, VIC 3010, Australia

*Corresponding author. E-mail address: gstevens@unimelb.edu.au

Abstract:

Tenova Pulsed Column Kinetics Internals (TPC-KIs) are a newly designed type of pulsed column internals with a novel structure that is expected to achieve less back-mixing, higher holdup and improved mass transfer. This study compared the hydrodynamic performance of TPC-KIs with standard disc and doughnut internals in a 2 m high 76 mm diameter pulsed solvent extraction column with the water-Alamine 336-Shellsol 2046 system. The effects of the wettability of column internals have also been considered. Dispersed phase holdup and Sauter mean droplet diameter were measured under various pulsation intensity and velocities of both phases, and empirical correlations for holdup and drop size have been refitted within absolute average relative errors within 15%. Tenova kinetics internals has lower holdup and larger Sauter-mean drop size compared to standard disc and doughnut internals, and these hydrodynamic parameters are predictable using the developed correlation in this study.

Key words:

Solvent extraction, pulsed column, TPC-KIs, Dispersed phase holdup, Sauter mean diameter, wettability, correlation