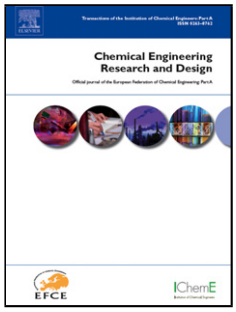

Title: STABILIzation OF HIGHLY CONCENTRATED EMULSIONS WITH OVERSATURATED DISPERSED PHASE: EFFECT OF SURFACTANT/PARTICLE RATIO

Author: Nsenda Ngenda Tshilumbu Irina Masalova

PII: S0263-8762(15)00231-2
DOI: http://dx.doi.org/doi:10.1016/j.cherd.2015.06.025
Reference: CHERD 1936

To appear in:

Received date: 22-12-2014
Revised date: 2-6-2015
Accepted date: 15-6-2015

Please cite this article as: Tshilumbu, N.N., Masalova, I.,STABILIzation OF HIGHLY CONCENTRATED EMULSIONS WITH OVERSATURATED DISPERSED PHASE: EFFECT OF SURFACTANT/PARTICLE RATIO, *Chemical Engineering Research and Design* (2015), http://dx.doi.org/10.1016/j.cherd.2015.06.025

STABILIZATION OF HIGHLY CONCENTRATED EMULSIONS WITH OVERSATURATED DISPERSED PHASE: EFFECT OF SURFACTANT/PARTICLE RATIO

Nsenda Ngenda Tshilumbu[a], Irina Masalova[b]

Department of Civil Engineering, Faculty of Engineering, Cape Peninsula University of Technology, PO Box 652, Cape Town 8000, Republic of South Africa

[a]Corresponding author: Steevetshilumbu@gmail.com; *Tshilumbun@cput.ac.za*; Tel: +27219598437

[b]Email address: *masalovai@cput.ac.za*

Highlights

- Highly concentrated water-in-oil emulsion with an oversaturated dispersed phase
- Emulsion inclined to crystallization of an internal phase
- Mixture of fumed nanosilica with surfactant is used as stabilizer
- Transitional point separating particles and surfactant domination regions
- Most stable emulsion to crystallization associated with the transitional point

Abstract

Currently, there is considerable interest in highly concentrated emulsions (HCE) due to both the variety of rheological effects that are observed in their deformation and flow and to their practical application in the mining, pharmaceutical, cosmetics and food industries. The material investigated is highly concentrated water-in-oil emulsion with a dispersed phase volume fraction of approximately 90%. The dispersed phase is a super-cooled solution of inorganic salts. Instability of such emulsions arises either from crystallization of the dispersed phase in the