

Accepted Manuscript

Nuclear magnetic resonance and small-angle X-ray scattering studies of mixed sodium dodecyl sulfate and N,N-dimethyldodecylamine N-oxide aqueous systems performed at low temperatures

Emily Summerton, Martin J. Hollamby, Cécile S. Le Duff, Emma S. Thompson, Tim Snow, Andrew J. Smith, Christopher Jones, Jeanluc Bettiol, Serafim Bakalis, Melanie M. Britton

PII: S0021-9797(18)31128-7
DOI: <https://doi.org/10.1016/j.jcis.2018.09.053>
Reference: YJCIS 24104

To appear in: *Journal of Colloid and Interface Science*

Received Date: 16 July 2018
Revised Date: 12 September 2018
Accepted Date: 15 September 2018

Please cite this article as: E. Summerton, M.J. Hollamby, C.S. Le Duff, E.S. Thompson, T. Snow, A.J. Smith, C. Jones, J. Bettiol, S. Bakalis, M.M. Britton, Nuclear magnetic resonance and small-angle X-ray scattering studies of mixed sodium dodecyl sulfate and N,N-dimethyldodecylamine N-oxide aqueous systems performed at low temperatures, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.09.053>

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.



Nuclear magnetic resonance and small-angle X-ray scattering studies of mixed sodium dodecyl sulfate and N,N-dimethyldodecylamine N-oxide aqueous systems performed at low temperatures

Emily Summerton^a, Martin J. Hollamby^b, Cécile S. Le Duff^c, Emma S. Thompson^c, Tim Snow^d, Andrew J. Smith^d, Christopher Jones^e, Jeanluc Bettiol^e, Serafim Bakalis^a and Melanie M. Britton^{c}*

^aSchool of Chemical Engineering, University of Birmingham, Edgbaston, B15 2TT, UK

^bSchool of Chemical and Physical Sciences, University of Keele, Keele, ST5 5TG, UK

^cSchool of Chemistry, University of Birmingham, Edgbaston, B15 2TT, UK

^dDiamond Light Source, Harwell Science and Innovation Campus, Didcot, OX11 0DE, UK

^eProcter & Gamble Brussels Innovation Centre, Temselaan 100, 1853, Strombeek Bever, Belgium

Abstract

Surfactant crystallisation is important in many applications in the food, consumer product and medical sectors. However, these processes are not well understood. In particular, surfactant crystallisation can be detrimental to the stability of detergent formulations, such as dish liquid products, resulting in a turbid solution that fails appearance criteria. With the rising global demand for detergent products, understanding the factors that influence formulation stability is of increasing importance. To enable industry to build more robust formulations, it is important to understand the underlying chemistry of the crystallisation process. Here, a model system containing anionic (sodium dodecyl sulfate, SDS) and amphoteric (N,N-dimethyldodecylamine N-oxide, DDAO) surfactants, at concentrations typical of dish liquid products, is studied. Variable temperature ¹H nuclear magnetic resonance (NMR) spectroscopy and small-angle X-ray scattering (SAXS) is used to probe the compositional and structural properties of this system, as a function of pH. On cooling, at pH 9, a mixture of hydrated crystals, predominately composed of SDS, and micelles containing both surfactants,

Download English Version:

<https://daneshyari.com/en/article/11020882>

Download Persian Version:

<https://daneshyari.com/article/11020882>

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