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Leonardo Chiappisi, Laurence Noirez, Michael Gradzielski

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A journey through the phase diagram of a pharmaceutically relevant microemulsion system

Leonardo Chiappisi^{a,*}, Laurence Noirez^b, Michael Gradzielski^{a,*}

^a*Technische Universität Berlin, Stranski Laboratorium für Physikalische Chemie und Theoretische Chemie, Institut für Chemie, Straße des 17. Juni 124, Sekr. TC7, D-10623 Berlin, Germany*

^b*Laboratoire Léon Brillouin (CEA-CNRS), CE-Saclay, 91191 Gif-sur-Yvette, France*

Abstract

Hypothesis: The phase behavior and the properties of water, oil, surfactant, and cosurfactant mixtures depend on the fine balance of different forces, among them the bending energy of the amphiphilic film. Thus, it should be possible to control the structural evolution of nonionic microemulsions by the cosurfactant content and the hydration of the surfactant headgroup.

Experiments: An extensive investigation of the pseudoternary phase diagram of mixtures of water, isopropyl palmitate, polyoxyethylene (10) oleyl ether Brij 97 (C₁₈E₁₀), and butanol is presented for two different cosurfactant concentrations, thereby varying the hydrophilicity of the amphiphile. The studies were performed employing conductometric titrations, differential scanning calorimetry (DSC), and small-angle neutron scattering (SANS).

Findings: A systematic growth of the domain sizes and correlation

*Corresponding Author. Present address of LC is: Technische Universität Berlin, Stranski Laboratorium für Physikalische Chemie und Theoretische Chemie, Institut für Chemie, Straße des 17. Juni 124, Sekr. TC7, D-10623 Berlin, Germany and Institut Max von Laue - Paul Langevin, 71 Avenue des Martyrs - 38042 Grenoble Cedex 9

Email addresses: leonardo.chiappisi@tu-berlin.de (Leonardo Chiappisi), michael.gradzielski@tu-berlin.de (Michael Gradzielski)

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