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Aggregation Behavior of Surfactants with Cationic and Anionic Dendronic Head Groups

Leonardo Chiappisi^{1,2}, Uwe Keiderling³, Carlos E. Gutierrez-Ulloa^{4,5}, Rafael Gómez^{4,6}, Mercedes Valiente⁷, Michael Gradzielski¹

1: Stranski-Laboratorium für Physikalische und Theoretische Chemie, Institut für Chemie, Technische Universität Berlin, D-10623 Berlin, Germany

2: Institut Max von Laue - Paul Langevin, 71 avenue des Martyrs, Grenoble Cedex 9 38042, France

3 : Helmholtz-Zentrum Berlin für Materialien and Energie, 14109 Berlin, Germany

4: Departamento de Química Inorgánica, IQAR, Universidad de Alcalá, E-28871 Madrid, Spain.

5: Networking Research Center on Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN), Madrid, Spain

6: Instituto Ramón y Cajal de Investigación Sanitaria, IRYCIS

7: Departamento de Química Analítica, Química Física e Ingeniería Química, IQAR, Universidad de Alcalá, E-28871 Madrid, Spain

Abstract

Hypothesis: Ionic dendronic head groups possess very different structural features than simple surfactant head groups. Accordingly, their self-assembly behaviour is expected to differ from that of conventional surfactants. The number of generations of the headgroup should play a particularly relevant role.

Experiments: A novel type of surfactants with different dendronic head groups (cationic and anionic) was studied in this work. A systematic variation of the number of generations of the head group ($n=1, 2, \text{ and } 3$), of the head group charge (cationic and anionic), and of the length of the hydrophobic chain (hexanoyl and hexadecanoyl chains) was performed and the self-assembly behaviour probed by means of small-angle neutron scattering (SANS) in order to obtain detailed structural insights.

Findings: The analysis of the scattering data shows that the general packing parameter concept applies also to dendrimeric surfactants and a larger head group results in smaller aggregates. However, in contrast to conventional surfactants, increasing the head group size results in a stronger tendency to self-aggregate, as a consequence of the head group's partly

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