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Data Article

Data on characterization of nano- and micro-structures resulting from glycine betaine surfactant/kappa-carrageenan interactions by Laser Scanning Confocal Microscopy and Transmission Electron Microscopy

Cédric Gaillard [a,*], Yunhui Wang [b,c], Rudy Covis [b,c], Thomas Vives [b,c], Maud Benoit [d], Thierry Benvegnu [b,c,**]

[a] U.R. 1268 Biopolymères Interactions Assemblages INRA BP-71, 627 Rue de la Géraudière, 44316 Nantes Cedex 3, France
[b] Ecole Nationale Supérieure de Chimie de Rennes, CNRS UMR6226, 11 allée de Beaulieu, CS50837, 35708 Rennes Cedex 7, France
[c] Université de Bretagne Loire, France
[d] Centre d'étude et de Valorisation des Algues, Presqu'île de Pen Lan – BP3, 22610 Pleubian, France

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ABSTRACT

This article contains data on the Laser Scanning Confocal Microscopy (LSCM) and Transmission Electron Microscopy (TEM) images related to multi-scaled self-assemblies resulting from 'green' cationic glycine betaine surfactant/anionic kappa-carrageenan interactions. These data gave clear evidence of the evolution of the micron-, nano-sized structures obtained at two surfactant/polymer molar ratios (3.5 and 0.8) and after the dilution of the aqueous dispersions with factors of 5 and 10 times. This data article is related to the research article entitled, "Monitoring the architecture of anionic κ-carrageenan/cationic glycine betaine amide surfactant assemblies by dilution: A multiscale approach" (Gaillard et al., 2017) [1].

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* Corresponding author.
** Corresponding author at: Université de Bretagne Loire, France.
E-mail addresses: cedric.gaillard@nantes.inra.fr (C. Gaillard), thierry.benvegnu@ensc-rennes.fr (T. Benvegnu).

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Specifications Table

Subject area	*Chemistry, Material Sciences, Soft Matter*
More specific subject area	*Structural analysis of nano-, micro- structures*
Type of data	*Figures*
How data was acquired	*Laser Scanning Confocal Microscopy (LSCM, Inverted Nikon A1 laser scanning confocal microscope (LSCM) and Transmission Electron Microscopy (TEM, JEOL JEM-1230 operated at 80 kV and equipped with a LaB6 filament*
Data format	*Analyzed*
Experimental factors	*LSCM: Aqueous dispersions of the surfactant/polysaccharide complexes were stained with 0.02% w/w acridine orange* *TEM: Sample-coated TEM grid was successively placed on a drop of an aqueous solution of uranyl acetate (2% w/w) for negatively staining, and on a drop of distilled water for rinsing. The grid was then air-dried before introducing them in the electron microscope*
Experimental features	*LSCM: samples viewed with Plan Fluor 4 × or 10 × Nikon objectives or with Plan Apo 20 × or 40 × Nikon objective by scanning using excitations brought about by the 488 nm emission and 561 nm emission lines of the He–Ne laser, and light emission was collected via a photomultiplier through a 500–530 nm and 570–620 nm band-pass filters, respectively. Images were processed using the NIS-Element* *TEM: micrographs were recorded on a Gatan 1.35 K × 1.04 K × 12 bit ES500W CCD camera.*
Data source location	*U.R. 1268 Biopolymères Interactions Assemblages INRA BP-71, 627 Rue de la Géraudière, 44316 Nantes Cedex 3, France*
Data accessibility	*Data is with this article*

Value of the data

- The given data provide structural information of particles based on multi-components at the micron- and nanometer scale range by using Laser Scanning Confocal Microscopy (LSCM) [2–4], and Transmission Electron Microscopy (TEM).
- The data provided by us help to understand the mechanism of formation of self-assemblies resulting from electrostatic interactions between multi-components.
- The data provided by us show influence of dilution on the architecture of assemblies composed of anionic polymers/cationic surfactants derived from renewable resources.
- The given data are useful to other researchers for developing applications of multi-scaled self-assemblies by mixing simply polymers and surfactants of opposite charge.

1. Data

Data refers to the LSCM and TEM experiments of 100% bio-sourced glycine betaine (GB) surfactant possessing a $C_{18:1}$ oleic fatty chain and kappa-carrageenan under pure forms in aqueous solutions (Fig. 1) or after their mixing at two different GB surfactant/κ-carrageenan molar ratios equal to *3.5* (sample A1: Figs. 2 and 3) and *0.8* (sample B1: Figs. 8 and 9) and after a dilution with a factor of 5 (*ratio 3.5* (sample A2): Figs. 4 and 5; *ratio 0.8* (sample B2): Figs. 10 and 11) and 10 (*ratio 3.5* (sample A3): Figs. 6 and 7; *ratio 0.8* (sample B3): Figs. 12 and 13) times. TEM observation shows the gradual dissociation of assemblies' nanostructures whereas LSCM identifies the distribution of cationic surfactant and anionic polysaccharide.

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