Contribution ID: **98** Type: **Poster**

How a hydroxyl group on hydrophobic chain can change surfactant self-assembly?

With global warming, green chemistry has experienced a great development. In this context, fatty acids are surfactants of particular interest since they can be extracted from agricultural resources. The use of an organic counter-ion enables their solubilization in aqueous solution at room temperature where they self-assemble into different supramolecular structures.
Stearic Acid (SA), one of the most common fatty acids in nature, self-assembles in lamellar phases in water[1]. In the other hand, the 12-Hydroxy-Stearic-Acid(12-HSA) fatty acid, self-assembles (using the same counter ion) in micrometric long multilamellar tubes[2]. Their packing parameter is very similar, and both structures are thermo-sensitive with a transition towards spherical micelles above a threshold temperature, which is however very different from SA to HSA.

In this sense, we have studied the behaviour of SA/12-HSA mixtures in order to find out how this OH group in 12-HSA's main chain influences thermally, structurally and mechanically the self-assemblies. To determine the structure and thermal properties of the SA/12-HSA self-assemblies, we used different techniques such as DSC, transmittance measurements and SANS experiments. We demonstrated that a doping of SA by a few amount 12-HSA molecules induces strong structural rearrangements whereas the reverse, i.e. doping 12-HSA by SA, almost does not change the structure. By rheology we have found three different modules (G' and G") states according to the SA/12-HSA ratio.

1. Wenlong Xu, Hongyao Gu, Xionglu Zhu, Yingping Zhong, Liwen Jiang, Mengxin Xu, Aixin Song, and Jingcheng Hao, Langmuir, 2015, 5758−5766
2. Fameau A.L.; Houinsou-Houssou B. Journal of Colloid and Interface Science 2010, 241, 38.

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Session Classification: Poster Session and Wine&cheese