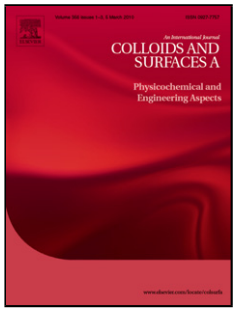

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Thermal Response of a Non-Ionic Surfactant Layer at the Water/Oil Interface During Microwave Heating

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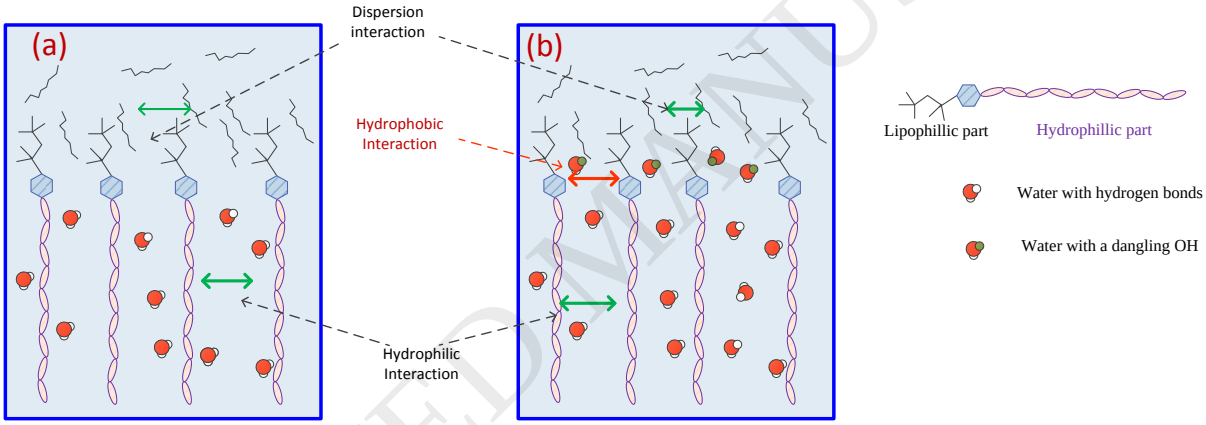
Graphical abstract



Abstract

This study measured *in-situ* the interfacial tension of the decane/water interface during microwave radiation, in the presence of the non-ionic surfactants Triton X-100 and X-405. It has been found that the two surfactants, with different hydrophilicity, displayed contrasting responses to the microwave heating. For X-100, the interfacial tension increased with the solution temperature. However, for X-105, the tension decreased as the solution temperature rose. The tension-temperature trends were consistent for a range of different microwave pulsing patterns. The results can be explained by considering the molecular origins of the interfacial forces. In particular, a semi-quantitative analysis verified that the hydrophobic