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Prediction for modification of liquid-liquid interface by energy concentration of microwave heating

Authors and affiliation

Yusuke Watanabe, Yosuke Shibata, Satoshi Sonobe, Yusuke Asakuma (University of Hyogo)

Anita Hyde, Chi Phan (Curtin University)

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Abstract (less than 300 words)

In previous study, surfactant at liquid-liquid interface is desorbed by microwave because microwave can pass through oil phase and approach water phase directly. However, the mechanism has not been clear perfectly. In this study, tension of oil-water interface was measured during and after microwave irradiation for the different surfactant concentration in water phase. The profiles of interfacial tension shows that the quick response was observed due to the thermal energy concentration by microwave absorption at the interface. The degree of interfacial modification could be predicted through our dimensionless number, which was proposed as an index for the energy concentration of microwave local heating. Moreover, surfactant desorption was caused by rotation/vibration of both water molecules and polar substituent of surfactant. In the future, microwave heating can be expected as a new demulsification method.

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