Supporting Information

Evaluation of bilgewater emulsion stability using non-destructive analytical methods

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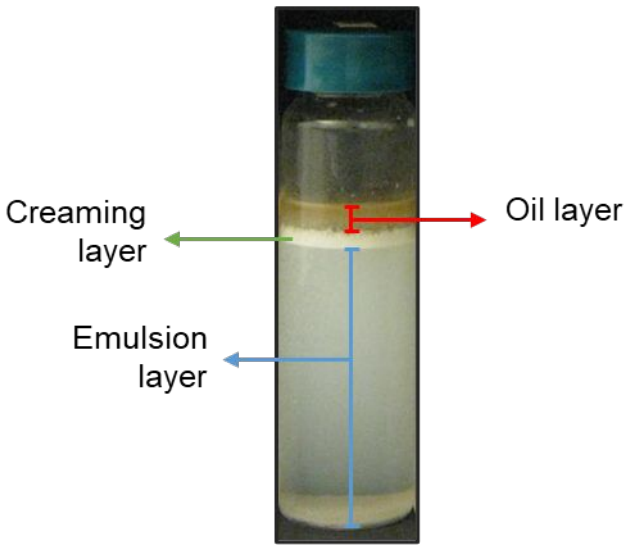

Fig. S1. Multi-layers of the oil-in-water emulsion samples. The emulsion layer only was collected for alkalinity analysis.

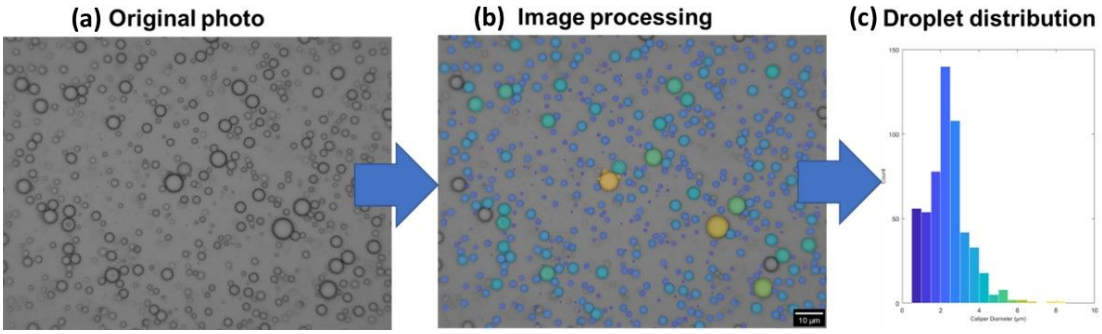

Fig. S2. Diagram of droplet distribution determination using microscopic images (400×) and image analysis software (MIPAR, Worthington, OH): (a) original photo, (b) image processing, and (c) droplet distribution. MIPAR (Materials Image Processing and Automated Reconstruction) is an image processing software that implements specific and automated detection algorithms to assist in the mapping and measurement of samples with complete precision. Separated Droplets (SKU P003-03), which is a fully automated solution for quantifying particle size in droplets with a dark outline, was used to generate the droplet distribution profiles. Initially, images were binarized using threshold pixel values to separate suspended oil droplets from the background water solution. Then the droplets were characterized into different size groups based on their Caliper Diameter and the total number of separate features per group was counted [1].

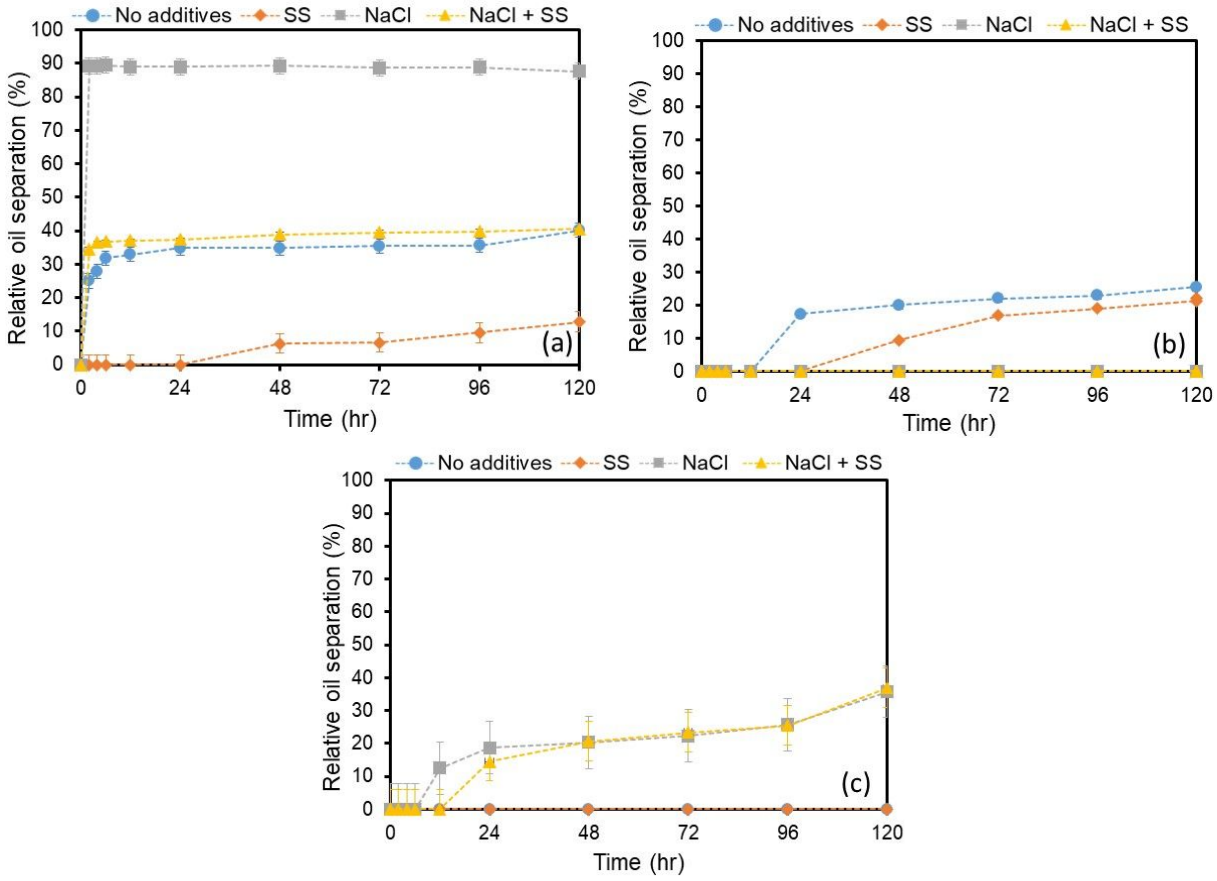

Fig. S3. Variation of the relative oil layer height (tendency to coalescence) of emulsion samples over time: (a) 7×CMC Triton X-100, (b) 7×CMC B&B 3100, and (c) 7×CMC SDS at 4°C.

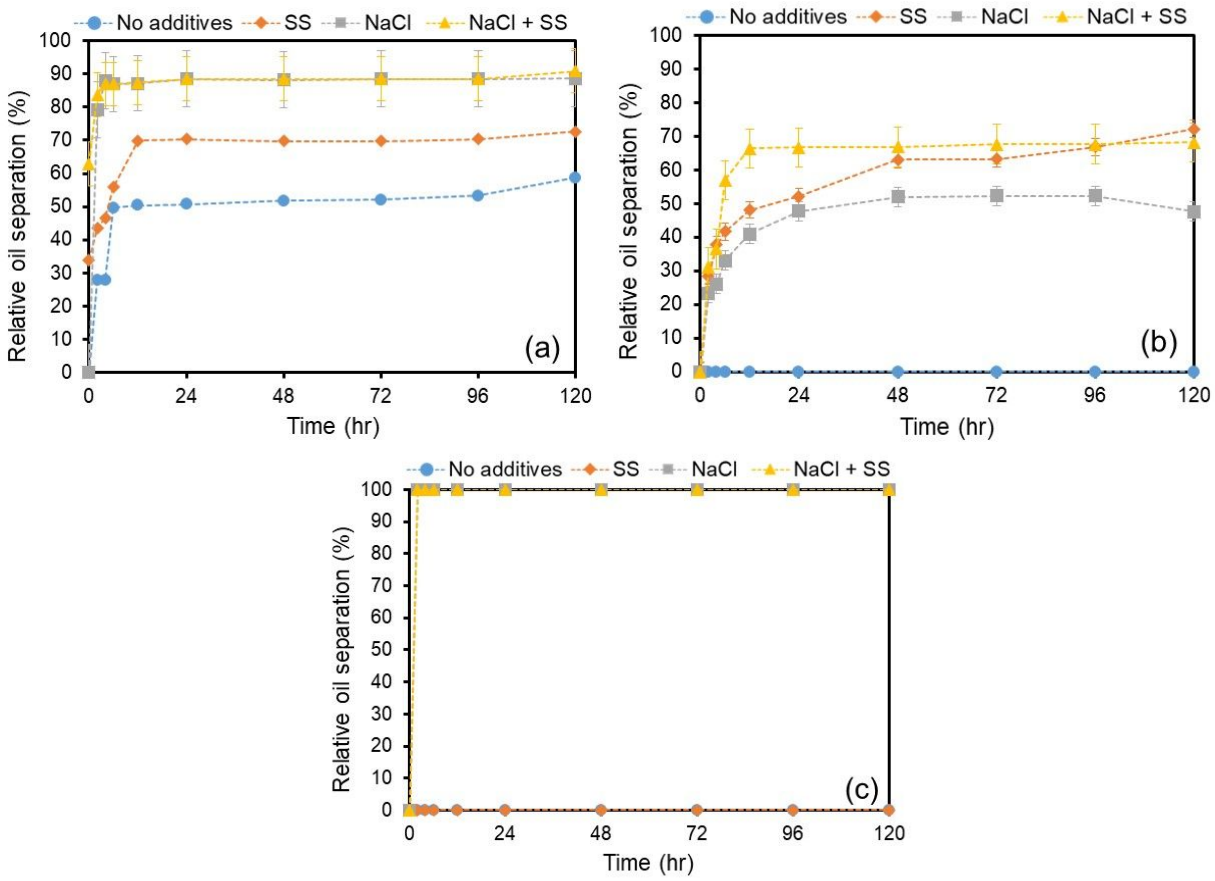

Fig. S4. Variation of the relative oil layer height (tendency to coalescence) of emulsion samples over time: (a) 7×CMC Triton X-100, (b) 7×CMC B&B 3100, and (c) 7×CMC SDS at 35°C.

References

1. Tsaoulidis, D.; Angeli, P., Liquid-liquid dispersions in intensified impinging-jets cells. *Chemical Engineering Science* **2017,** 171, 149-159.