

## Supplementary information

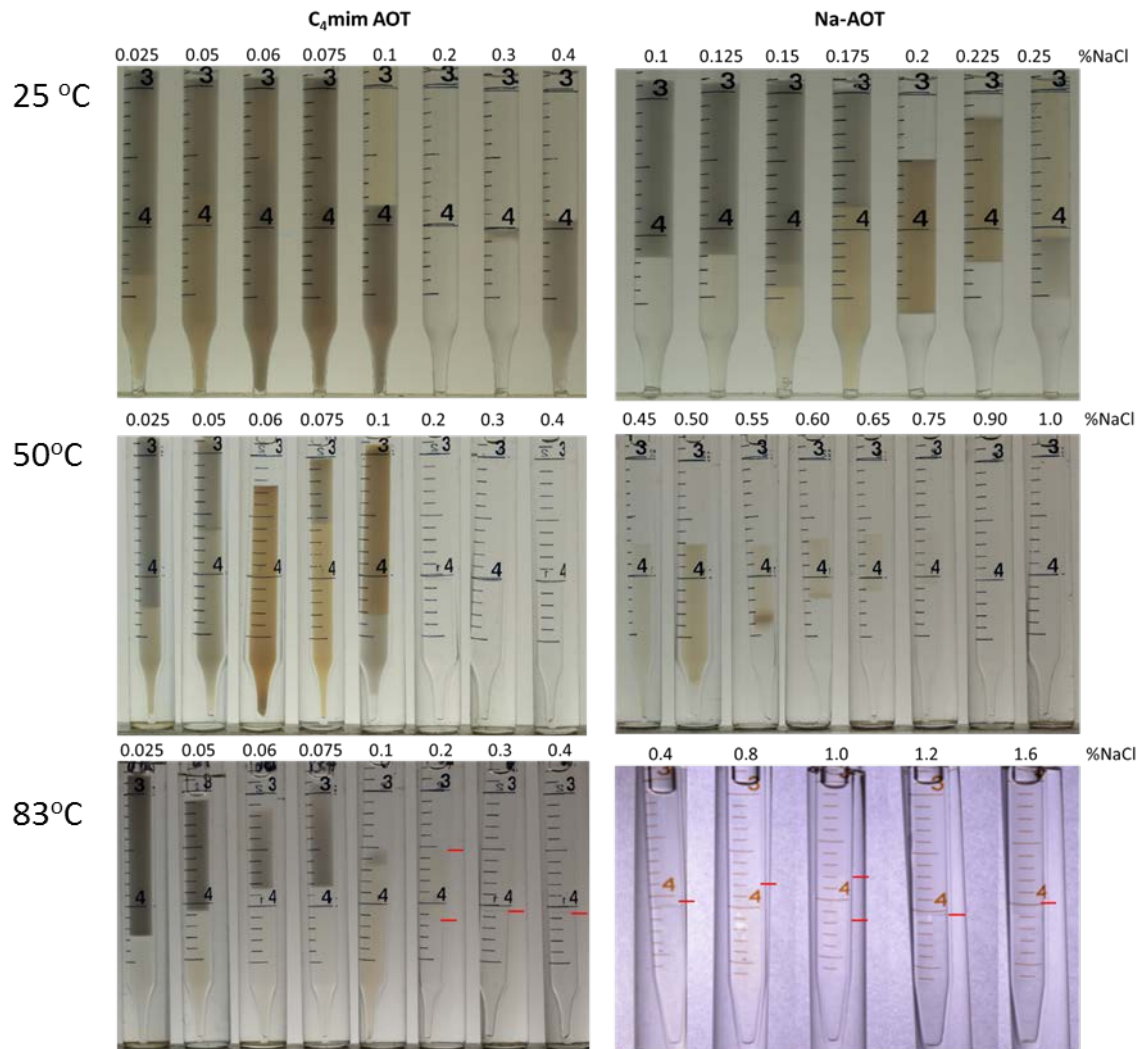


Figure S1. Salinity scans at 25, 50 and 83 °C for 2 %wt  $[C_4mim][AOT]$  (left) and its parent compound Na-AOT (right), WOR~1, n-octane, NaCl brine.

[C<sub>12</sub>mim]Br 9/1 8/2 7/3 6/4 5/5 4/6 3/7 2/8 1/9 [C<sub>4</sub>mim]AOT

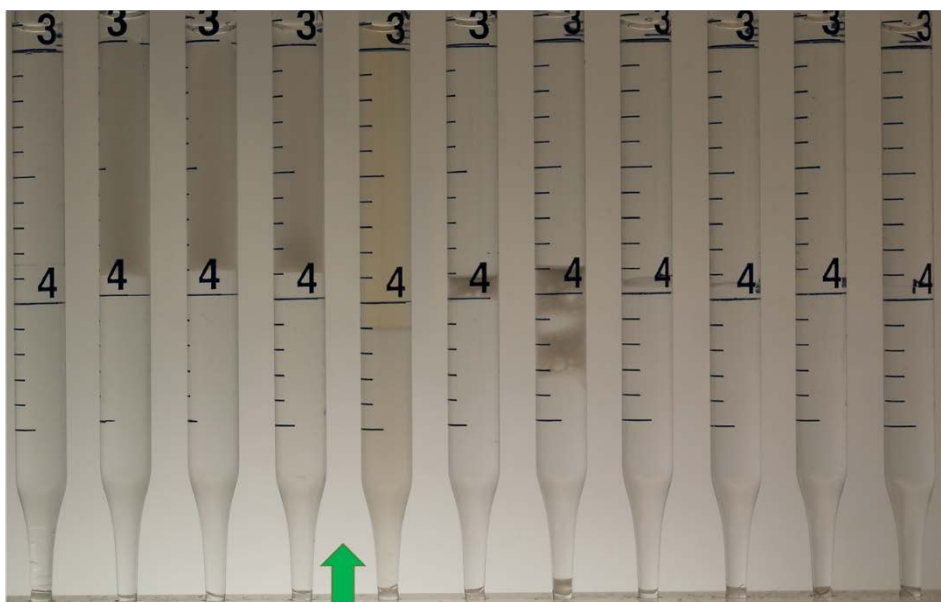


Figure S2. Blend scan at 25 °C for 2 %wt [C<sub>12</sub>mim]Br / [C<sub>4</sub>mim]AOT WPR~1, n-octane, 5 %wt NaCl brine.

Sample 0 1 2 3 4 5 6 7 8 9 10  
Blend ratio 7/3 6.9/3.1 6.8/3.2 6.7/3.3 6.6/3.4 6.5/3.5 6.4/3.6 6.3/3.0 6.2/3.8 6.1/3.9 6/4

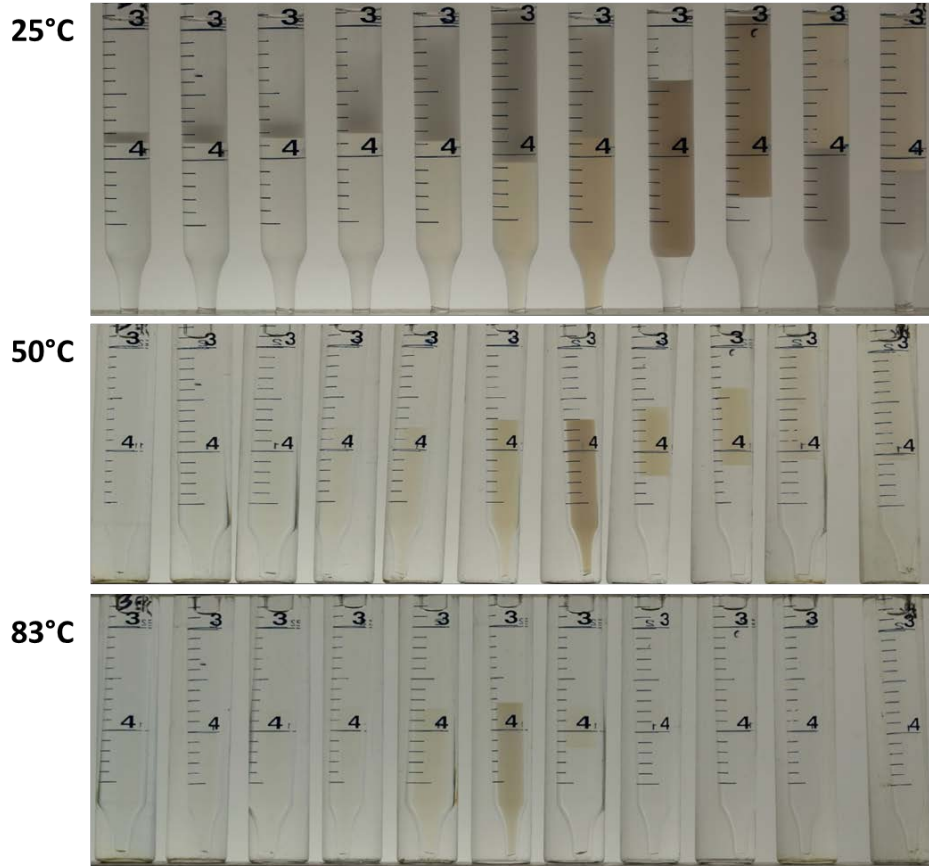


Figure S3. Blend scans at 25, 50 and 83 °C for 2 %wt [C<sub>12</sub>mim]Br/ [C<sub>4</sub>mim]AOT, WOR~1, n-octane, 5 %wt NaCl brine.

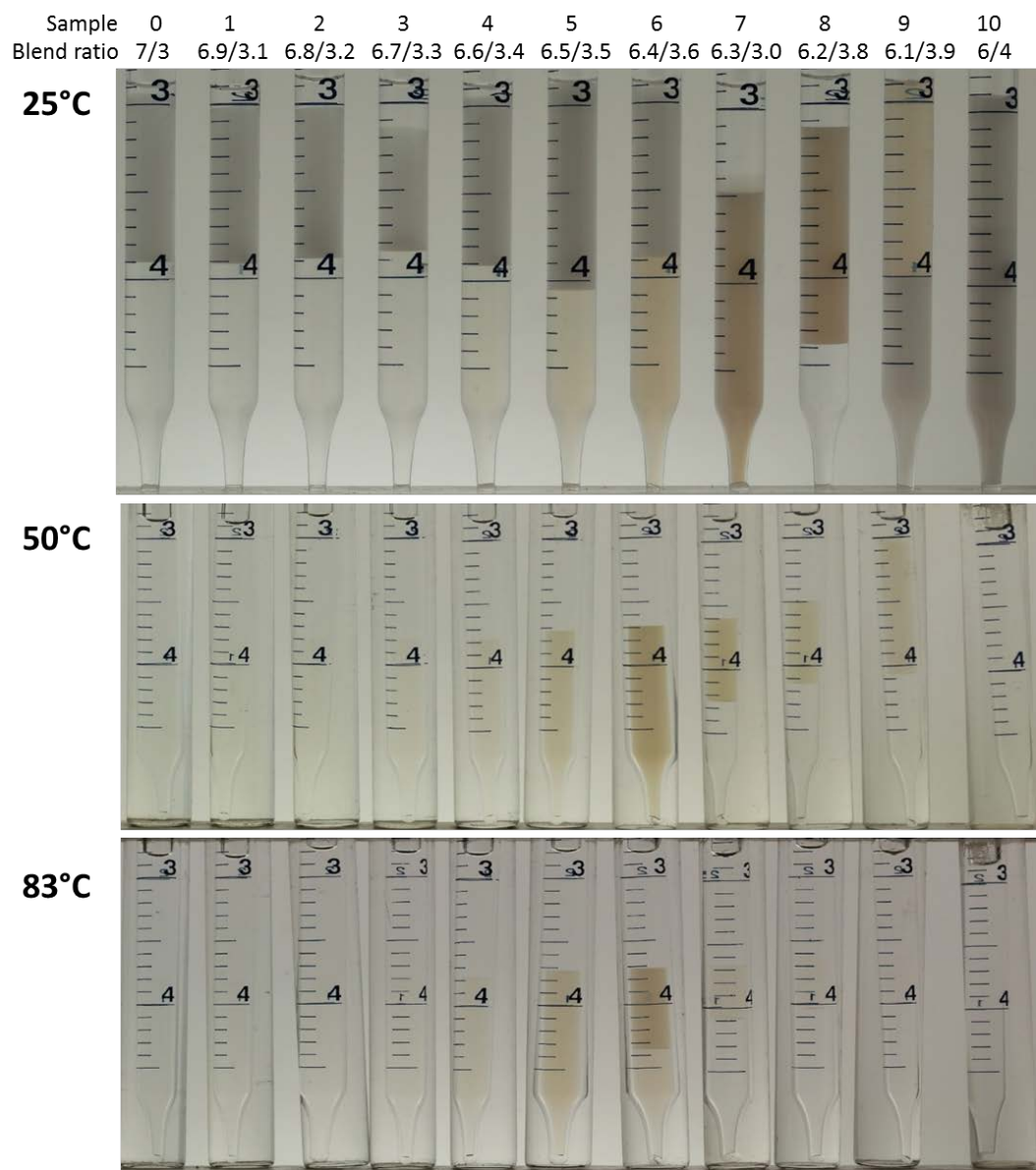


Figure S4. Blend scans at 25, 50 and 83 °C for 2 %wt [C<sub>12</sub>mim]Br/[C<sub>4</sub>mim]AOT, WOR~1, *n*-octane, seawater.

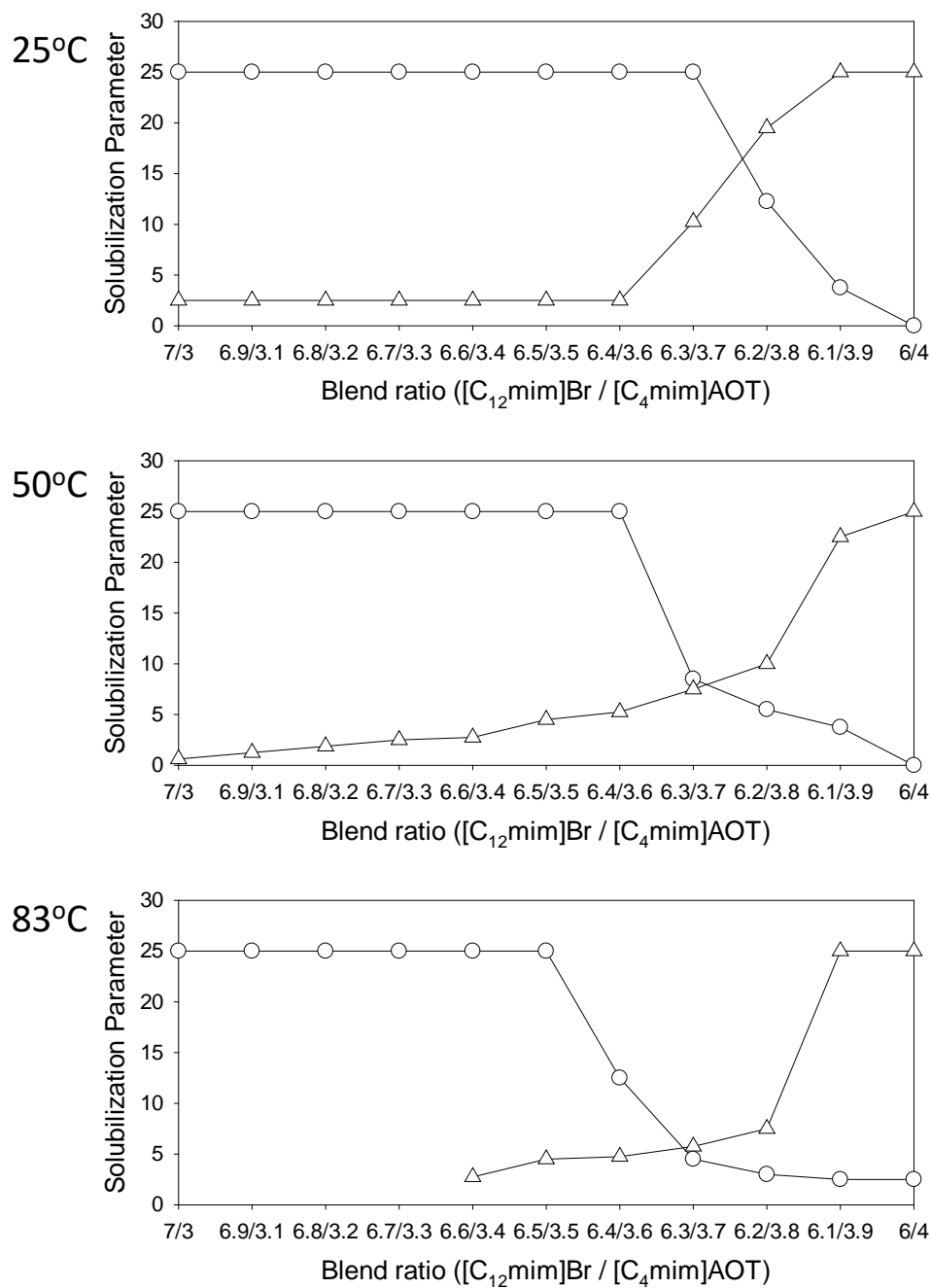


Figure S5. Solubilization parameters (  $\circ$  V<sub>w</sub>/V<sub>s</sub> ,  $\triangle$  V<sub>o</sub>/V<sub>s</sub> ) from blend scans at 25, 50 and 83 °C for 2 %wt [C<sub>12</sub>mim]Br/[C<sub>4</sub>mim]AOT, WOR~1, *n*-octane, seawater.

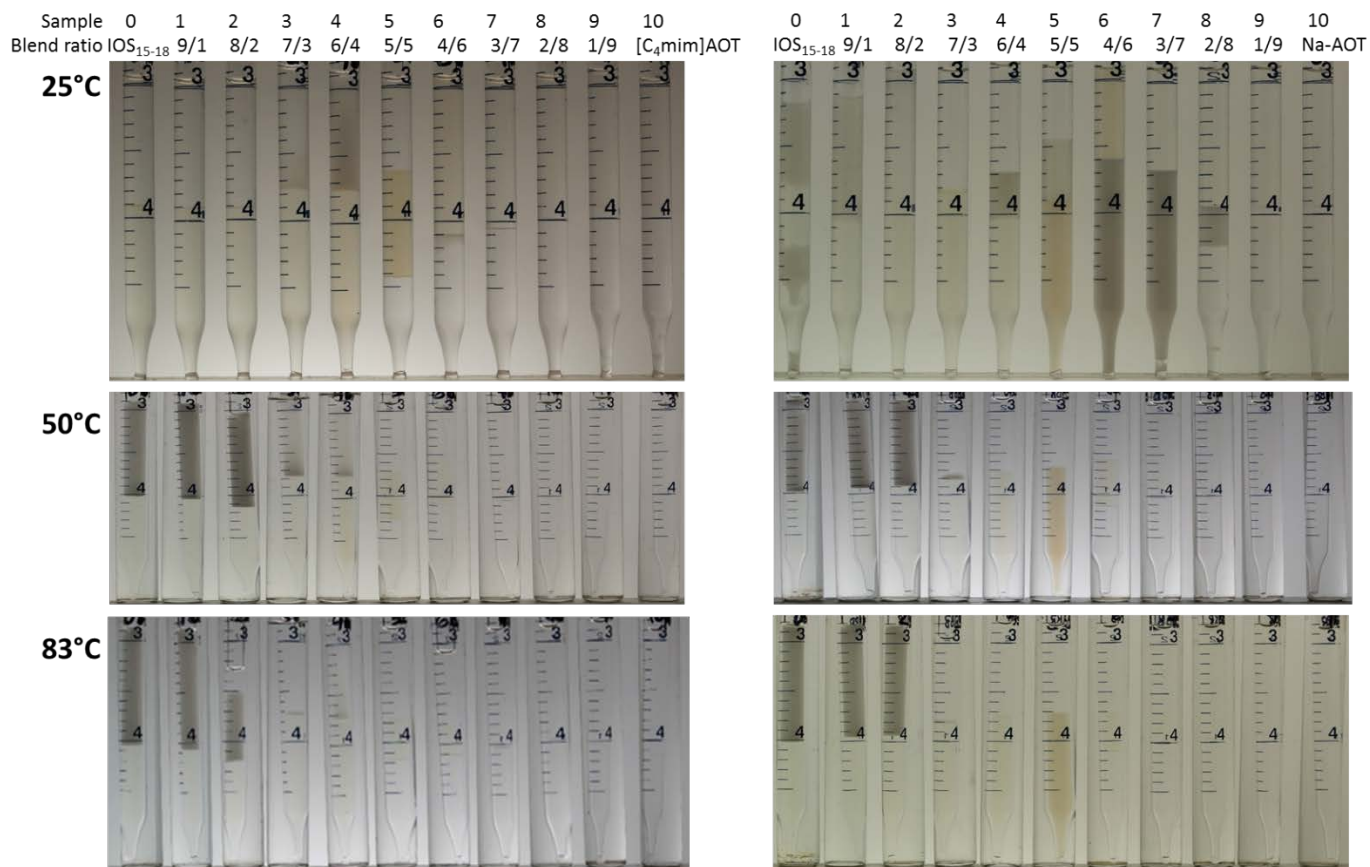


Figure S6. Blend scans at 25, 50 and 83 °C for 2 wt% IOS<sub>15-18</sub> / [C<sub>4</sub>mim]AOT (left) and IOS<sub>15-18</sub> / Na-AOT (right), WOR~1, *n*-octane, 5 %wt NaCl brine.

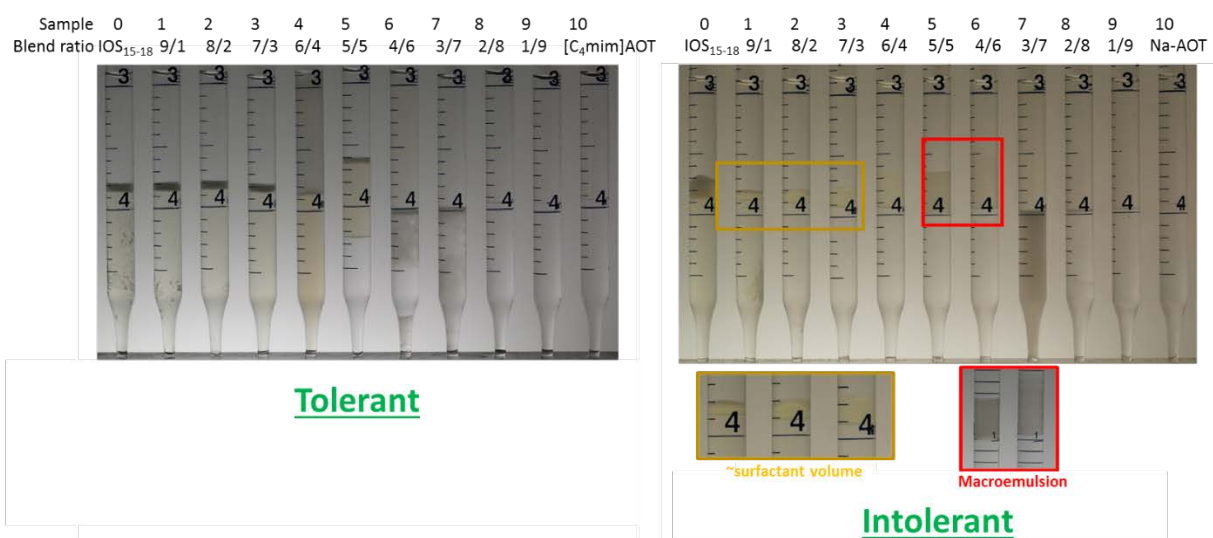


Figure S7. Blend scans at 25 °C for 2 %wt IOS<sub>15-18</sub> / [C<sub>4</sub>mim]AOT (left) and IOS<sub>15-18</sub> / Na-AOT (right), WOR~1, *n*-octane, seawater.

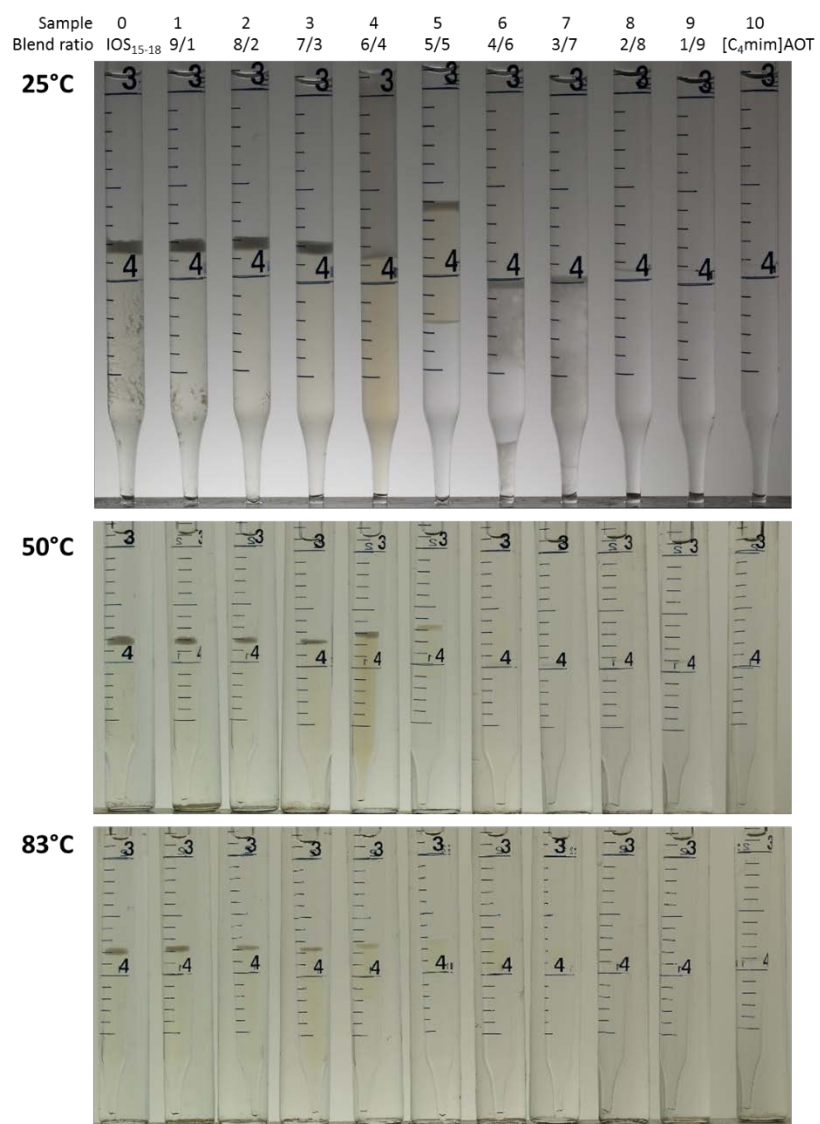


Figure S8. Blend scans at 25, 50 and 83 °C for 2 %wt IOS<sub>15-18</sub> / [C<sub>4</sub>mim]AOT, WOR~1, *n*-octane, seawater.

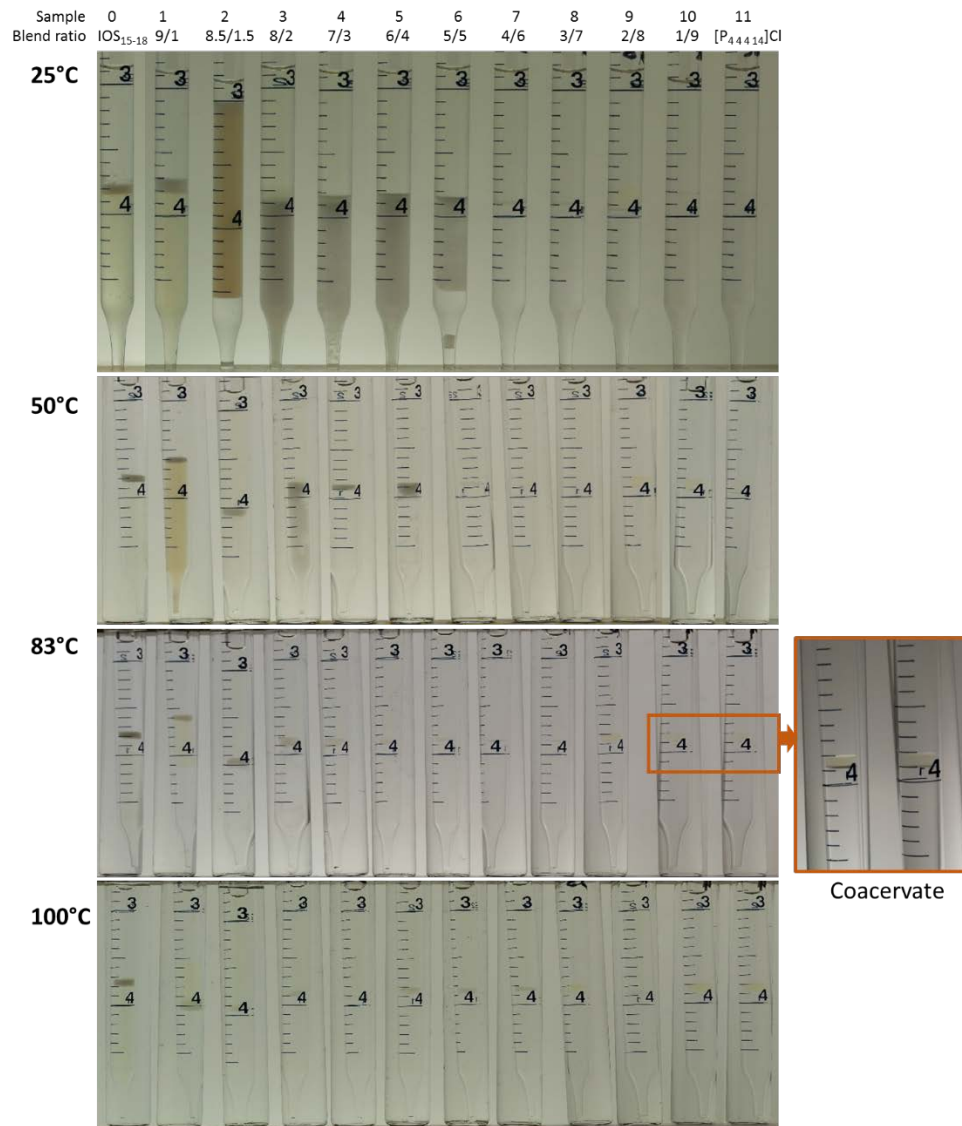


Figure S9. Blend scans at 25, 50, 83 and 100 °C for 2 %wt IOS<sub>15-18</sub> / [P<sub>44414</sub>]Cl, WOR~1, *n*-octane, seawater.

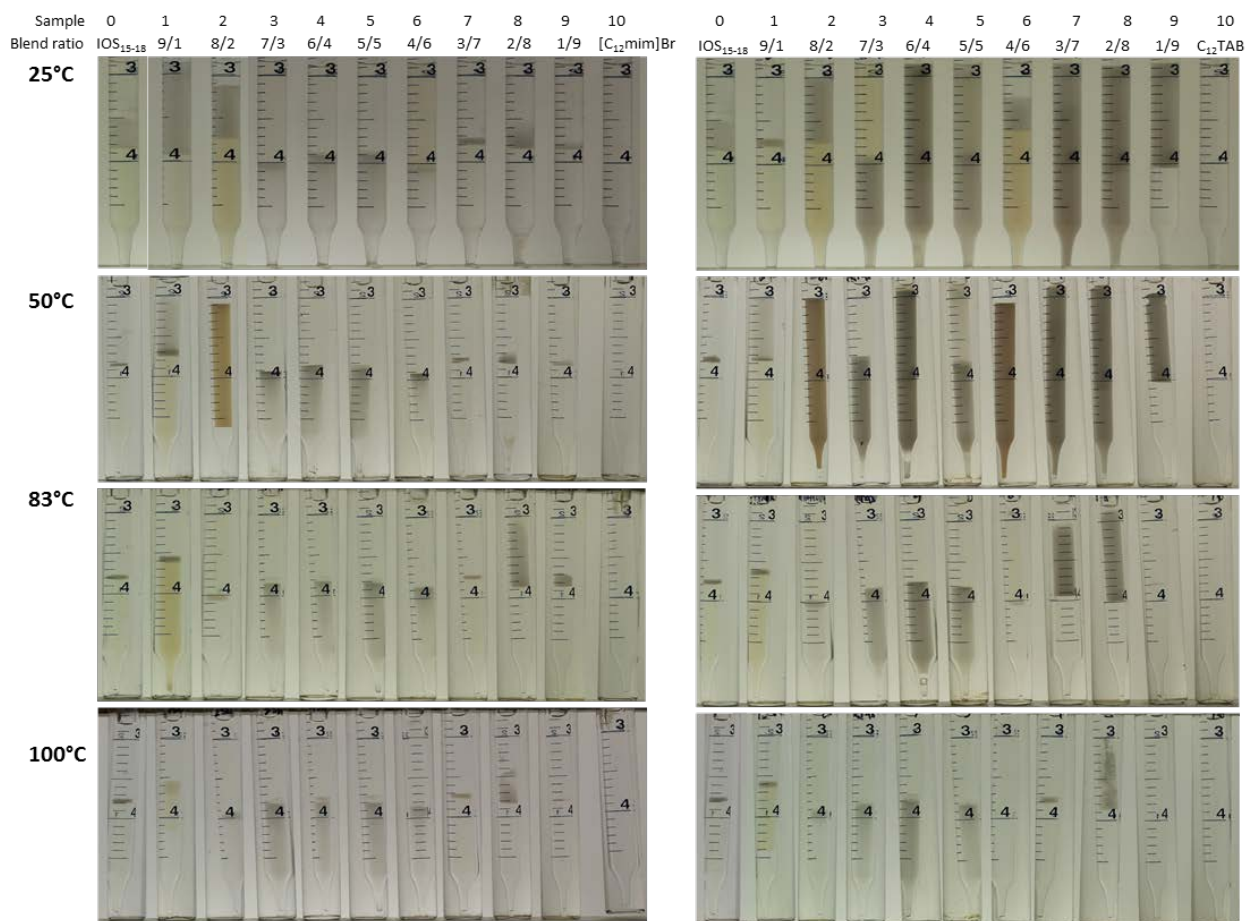


Figure S10. Blend scans at 25, 50 and 83 °C for 2 %wt IOS<sub>15-18</sub>/ [C<sub>12</sub>mim]Br (left) and IOS<sub>15-18</sub>/C<sub>12</sub>TAB (right), WOR~1, *n*-octane, seawater.