## Supporting Information

## Simultaneous determination of interfacial molarities of alcohol, bromide ion, and water during alcohol induced microstructural transition: The difference between medium and long chain alcohols.

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## Section I : Reological measurements

Figure S1. The steady shear viscosity as a function of shear rate for the aqueous solutions of 0.1 M CTAB containing 0.1 M KBr and (A) $5-45 \mathrm{mM} \mathrm{C}_{8} \mathrm{OH}$ or (B) $5-45 \mathrm{mM} \mathrm{C} 4 \mathrm{OH}$.


Section II : TEM images
Figure S2. TEM images of $0.1 \mathrm{M} \mathrm{CTAB} / 0.1 \mathrm{M} \mathrm{KBr}$ containing 5 mM C 8 OH (A \& B) and $40 \mathrm{mM} \mathrm{C}_{8} \mathrm{OH}$ ( $\mathrm{C} \& \mathrm{D}$ ).


## Section III : Turbidity measurements.

Turbidity was obtained using an UV-visible spectrophotometer, UV-3600 230VCE, Shimadzu Corporation, at $25^{\circ} \mathrm{C}$. The resolution was 0.1 nm . The wavelength was 500 nm .

Figure S3. The changes of turbidity with the concentration of added butanol or octanol at $25^{\circ} \mathrm{C}$.


## Section IV: Chemical trapping with $1-\mathrm{ArN}_{2}{ }^{+}$in aqueous TMABr solutions.

Aqueous TMABr stock solutions were prepared via a routine procedure in which the weights of both the salt and the water were obtained by measuring them in weighed 10 mL volumetric flasks. TMABr was weighed in a 10 mL flask and sufficient water was added to dissolve it and then it was diluted to the mark. The weight of water was determined by difference between the total weight minus the total weight of salt and the flask. The stock solutions were used to prepare sets of TMABr solutions containing incremental amounts of the stock solutions in 2 mL volumetric flasks. The solution acidity was set by adding $20 \mu \mathrm{~L}$ of 0.1 M HBr to give a final HBr concentration of 1 mM . The weight of water in each 2 mL flask was obtained from the calculated weight of water in the aliquot of the stock solution plus the weight of water added to fill the 2 mL flask to the mark. These weights were used to calculate the molarities of $\mathrm{Br}^{-}$and $\mathrm{H}_{2} \mathrm{O}$ because the solutions were concentrated and salt occupies a significant fraction of the total solution volume. To initiate the dediazoniation reactions, $20 \mu \mathrm{~L}$ of freshly prepared stock solutions of $1-\mathrm{ArN}_{2} \mathrm{BF}_{4}$ in ice-cold MeCN were added to give a final probe concentration of $5 \times 10^{-3} \mathrm{M} .100 \mu \mathrm{~L}$ of cyclohexane were layered on top of the solutions to prevent the evaporation of volatile $1-\mathrm{ArBr}$ and $1-\mathrm{ArOH}$ products. The volumetric flasks were sealed with Parafilm and equilibrated at $25^{\circ} \mathrm{C}$ for 2 days. Prior to HPLC analysis, the product mixture was diluted 5 -fold with MeOH to dissolve both the cyclohexane and the aqueous salt solution. Conditions for product separation on the HPLC were the following: an $80 \% \mathrm{MeOH} / 20 \% \mathrm{H} 2 \mathrm{O}(\mathrm{v} / \mathrm{v})$ mobile
phase; flow rate $=0.6 \mathrm{~mL} / \mathrm{min}$; detector wavelength $=230 \mathrm{~nm}$; the injection volume was $50 \mu \mathrm{~L}$. Percent yields were obtained from average values of peak areas from triplicate or duplicate injections with the calibration curves obtained for the particular product. Product yields are in Table S1.

Figure $\mathbf{S 4}$ shows the plot between the normalized yields of $1-\mathrm{ArBr}, \% 1-\mathrm{ArBr}_{\mathrm{N}}$, and total bromide ion concentration, $\left[\mathrm{Br}_{\mathrm{t}}\right]$, in TMABr aqueous solutions. The data was also fitted into Equation S1, which was employed as the standard curve. The standard curve was used to estimate the interfacial bromide ion molarities according to the basic assumption of chemical trapping : when the yield are the same, the concentrations are the same.

$$
\begin{equation*}
\% 1-\mathrm{ArBr}_{\mathrm{N}}=10.38+11.04\left[\mathrm{Br}_{\mathrm{t}}\right] \tag{S1}
\end{equation*}
$$

Figure $\mathbf{S 5}$ shows the plot of the selectivity between bromide ion and water, $S_{\mathrm{w}}{ }^{\mathrm{Br}}$ versus $\left[\mathrm{Br}_{\mathrm{t}}\right]$ in TMABr aqueous solutions. The data was also fitted into Equation S2, which was used to estimate the selectivity, $S_{\mathrm{w}}{ }^{\mathrm{Br}}$, at the interfacial region of CTAB micelles.

$$
\begin{equation*}
S_{\mathrm{w}}{ }^{\mathrm{Br}}=13.40-1.38\left[\mathrm{Br}_{\mathrm{t}}\right] \tag{S2}
\end{equation*}
$$

Table S1. HPLC peak areas, observed and normalized (subscript N ) product yields for dediazoniation of $1-\mathrm{ArN}_{2}{ }^{+}$in aqueous TMABr solutions at $25^{\circ} \mathrm{C}$ and 1 mM HBr , and values for total Br , water concentration, selectivities, $S_{\mathrm{w}}{ }^{\mathrm{Br}}$, and $\mathrm{H}_{2} \mathrm{O} / \mathrm{Br}$ molar ratios. ${ }^{\text {a }}$

| $\begin{gathered} {\left[\mathrm{Br}_{t}\right]} \\ \mathrm{M} \end{gathered}$ | $\begin{gathered} {\left[\mathrm{H}_{2} \mathrm{O}\right]} \\ \mathrm{M} \end{gathered}$ | Peak Areas $\left(10^{6} \mu \mathrm{v} \bullet \text { s }\right)^{\text {b }}$ |  | Observed Yields (\%) ${ }^{\text {c }}$ |  |  | Normalized Yields (\%) ${ }^{\text {d }}$ |  | $S_{\text {w }}{ }^{\text {Bre }}$ | $\left[\mathrm{H}_{2} \mathrm{O}\right] /\left[\mathrm{Br}_{t}\right]$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 1-ArOH | $1-\mathrm{ArBr}$ | 1-ArOH | $1-\mathrm{ArBr}$ | Total | $1-\mathrm{ArOH}_{\mathrm{N}}$ | $1-\mathrm{ArBr}_{\mathrm{N}}$ |  |  |
| 0.011 | 55.5 | 12.040 | 0.131 | 95.0 | 0.582 | 95.6 | 99.4 | 0.608 | 30.9 | 5044.4 |
| 0.021 | 55.4 | 11.708 | 0.228 | 92.4 | 1.01 | 93.4 | 98.9 | 1.08 | 28.8 | 2639.1 |
| 0.036 | 55.3 | 11.980 | 0.366 | 92.8 | 1.59 | 94.4 | 98.3 | 1.68 | 26.3 | 1536.7 |
| 0.054 | 55.2 | 11.804 | 0.514 | 91.4 | 2.23 | 93.7 | 97.6 | 2.38 | 25.0 | 1022.3 |
| 0.071 | 55.1 | 12.253 | 0.602 | 94.9 | 2.61 | 97.5 | 97.3 | 2.68 | 21.4 | 775.8 |
| 0.088 | 55.0 | 11.940 | 0.741 | 92.5 | 3.22 | 95.7 | 96.6 | 3.36 | 21.7 | 624.6 |
| 0.1 | 54.9 | 12.015 | 0.836 | 91.0 | 3.55 | 94.5 | 96.2 | 3.75 | 21.4 | 548.8 |
| 0.2 | 54.2 | 11.717 | 1.400 | 88.7 | 5.94 | 94.7 | 93.7 | 6.27 | 18.1 | 271.0 |
| 0.3 | 53.5 | 11.240 | 1.831 | 85.1 | 7.77 | 92.9 | 91.6 | 8.36 | 16.3 | 178.4 |
| 0.5 | 52.2 | 10.629 | 2.777 | 85.5 | 12.5 | 98.0 | 87.2 | 12.8 | 15.3 | 104.4 |
| 1 | 48.8 | 9.185 | 3.968 | 73.9 | 17.9 | 91.8 | 80.5 | 19.5 | 11.8 | 48.8 |
| 1.5 | 45.4 | 7.722 | 5.198 | 63.4 | 23.9 | 87.3 | 72.6 | 27.4 | 11.43 | 30.3 |
| 2 | 42.1 | 7.795 | 6.332 | 62.7 | 28.5 | 91.3 | 68.7 | 31.3 | 9.57 | 21.0 |
| 2.5 | 38.7 | 6.670 | 7.496 | 54.8 | 34.5 | 89.2 | 61.4 | 38.6 | 9.75 | 15.5 |
| 3 | 35.3 | 6.031 | 8.435 | 49.5 | 38.8 | 88.3 | 56.1 | 43.9 | 9.23 | 11.8 |
| 3.5 | 32.0 | 5.518 | 9.366 | 45.3 | 43.1 | 88.4 | 51.3 | 48.7 | 8.68 | 9.13 |

a. Reaction time ca. 48 hours. The concentrations of $1-\mathrm{ArN}_{2} \mathrm{BF}_{4}$ were around $1 \times 10^{-3} \mathrm{M}$ but vary in each experiment. $100 \mu \mathrm{l}$ of cyclohexane was layered on top of TMABr solutions in 2 ml volumetric flasks to prevent the evaporation of 1-ArBr. Prior to HPLC analysis, the product mixture was diluted 5 fold with methanol to dissolve both the cyclohexane and the aqueous salt solution.
b. $50 \mu \mathrm{~L}$ sample injections. Peak areas are average of triplicate injections. Eluting solvents: $80 \% \mathrm{MeOH} / 20 \% \mathrm{H}_{2} \mathrm{O}$; Flow rate: $0.6 \mathrm{ml} / \mathrm{min}$; Detector wavelength: 230 nm .
c. HPLC calibration curves (y-peak area in $\mu \mathrm{vs}$; x -concentraiton in molarity):

$$
\mathrm{y}(1-\mathrm{ArOH})=1.300 \times 10^{10} \mathrm{x}\left(\mathrm{R}^{2}=0.9995\right) ; \mathrm{y}(1-\mathrm{ArBr})=2.321 \times 10^{10} \mathrm{x}+14530\left(\mathrm{R}^{2}=0.9998\right)
$$

d. $\% 1-\mathrm{ArBr}_{\mathrm{N}}=100(\% 1-\mathrm{ArBr}) /(\% 1-\mathrm{ArOH}+\% 1-\mathrm{ArBr}) ; \% 1-\mathrm{ArOH}_{\mathrm{N}}=100(\% 1-\mathrm{ArOH}) /(\% 1-\mathrm{ArOH}+\% 1-\mathrm{ArBr})$.
e. $S_{\mathrm{w}}{ }^{\mathrm{Br}}=\left[\mathrm{H}_{2} \mathrm{O}\right](\% 1-\mathrm{ArBr}) /\left[\mathrm{Br}_{\mathrm{t}}\right](\% 1-\mathrm{ArOH})$

Figure S4 Plot between the normalized yields of $1-\mathrm{ArBr}, \% 1-\mathrm{ArBr}_{\mathrm{N}}$, and total bromide ion concentration, [ $\left.\mathrm{Br}_{\mathrm{t}}\right]$, in TMABr aqueous solutions ( $[\mathrm{HBr}]=1 \mathrm{mM}$ ) (a) containing 0 to $3.5 \mathrm{M}\left[\mathrm{Br}_{\mathrm{t}}\right]$; and (b) containing 1.5 to $3.5 \mathrm{M}\left[\mathrm{Br}_{\mathrm{t}}\right]$ fitted to equation $\% 1-\mathrm{ArBr}_{\mathrm{N}}=10.38+11.04\left[\mathrm{Br}_{\mathrm{t}}\right]$.


Figure S5 Plot between $S_{\mathrm{w}}{ }^{\mathrm{Br}}$ and $\left[\mathrm{Br}_{\mathrm{t}}\right]$, in TMABr aqueous solutions ( $[\mathrm{HBr}]=1 \mathrm{mM}$ ) (a) containing 0 to $3.5 \mathrm{M}\left[\mathrm{Br}_{\mathrm{t}}\right]$; and (b) containing 1.5 to $3.5 \mathrm{M}\left[\mathrm{Br}_{\mathrm{t}}\right]$ fitted to equation $S_{\mathrm{w}}{ }^{\mathrm{Br}}=13.40-1.38\left[\mathrm{Br}_{\mathrm{t}}\right]$.


## Section V: Interfacial molarities

Table S2. Estimated values of interfacial molarities of water, $\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}}$, bromide ions, $\mathrm{Br}_{\mathrm{m}}$, and butanol, $\mathrm{C}_{4} \mathrm{OH}_{\mathrm{m}}$, in aqueous solutions of $0.1 \mathrm{M} \mathrm{CTAB} / 0.1 \mathrm{M} \mathrm{KBr}$ containing $0-54.6 \mathrm{mM}$ Butanol $\left(\mathrm{C}_{4} \mathbf{O H}\right)$ at $25^{\circ} \mathrm{C} .[\mathrm{HBr}]=1 \mathrm{mM} .{ }^{\mathrm{a}}$

| $\left[\mathrm{C}_{4} \mathrm{OH}\right]$ |
| :---: | :---: | :---: | :---: |
| $(\mathrm{mM})$ |$\quad$| $\mathrm{Br}_{\mathrm{m}}{ }^{\mathrm{a}}$ |  |  |
| :---: | :---: | :---: |
| $(\mathrm{M})$ | $\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}}{ }^{\mathrm{b}}$ | $\mathrm{C}_{4} \mathrm{OH}_{\mathrm{m}}{ }^{\mathrm{c}}$ |
| $(\mathrm{M})$ | $(\mathrm{M})$ |  |

a. $\quad \mathrm{Br}_{\mathrm{m}}=\left(\% 16-\mathrm{ArBr}_{\mathrm{N}}-10.38\right) / 11.04$
b. $\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}}=S_{\mathrm{w}}{ }^{\mathrm{Br}} \times \mathrm{Br}_{\mathrm{m}}\left(\% 16-\mathrm{ArOH}_{\mathrm{N}}\right) /\left(\% 16-\mathrm{ArBr}_{\mathrm{N}}\right)$
c. $\mathrm{C}_{4} \mathrm{OH}_{\mathrm{m}}=\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}} \mathrm{x}\left(\% 16-\mathrm{ArOBu}_{\mathrm{N}}\right) /\left[S_{\mathrm{w}}{ }^{\mathrm{ROH}} \mathrm{x}\left(\% 16-\mathrm{ArOH}_{\mathrm{N}}\right)\right] ; S_{\mathrm{w}}{ }^{\mathrm{ROH}} \approx 1$ according to ref ${ }^{1}$.

Table S3. Estimated values of interfacial molarities of water, $\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}}$, bromide ions, $\mathrm{Br}_{\mathrm{m}}$, and Octanol, $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}$, in aqueous solutions of $0.1 \mathrm{M} \mathrm{CTAB} / 0.1 \mathrm{M} \mathrm{KBr}$ containing $0-55 \mathrm{mM}$ Octanol ( $\mathrm{C}_{8} 0 \mathrm{H}$ ) at $25^{\circ} \mathrm{C}$. $[\mathrm{HBr}]=1 \mathrm{mM} .{ }^{\mathrm{a}}$

| $\left[\begin{array}{c}{\left[\mathrm{C}_{8} \mathrm{OH}\right]} \\ (\mathrm{mM})\end{array}\right.$ | $\mathrm{Br}_{\mathrm{m}}{ }^{\mathrm{a}}$ <br> $(\mathrm{M})$ | $\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}}{ }^{\mathrm{b}}$ <br> $(\mathrm{M})$ | $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}{ }^{\mathrm{c}}$ <br> $(\mathrm{M})$ |
| :---: | :---: | :---: | :---: |
| 0.0 | 2.69 | 39.0 | 0.00 |
| 6.35 | 2.65 | 39.2 | 0.15 |
| 12.7 | $2.61( \pm 0.01)^{\mathrm{d}}$ | $39.5( \pm 0.1)$ | $0.20( \pm 0.01)$ |
| 15.9 | $2.58( \pm 0.01)$ | $39.7( \pm 0.1)$ | $0.22( \pm 0.01)$ |
| 19.0 | $2.54( \pm 0.01)$ | $40.0( \pm 0.1)$ | $0.26( \pm 0.01)$ |
| 22.2 | $2.50( \pm 0.01)$ | $40.3( \pm 0.1)$ | $0.31( \pm 0.01)$ |
| 25.4 | $2.47( \pm 0.01)$ | $40.5( \pm 0.1)$ | $0.40( \pm 0.01)$ |
| 31.8 | 2.39 | 41.0 | 0.48 |
| 34.9 | 2.36 | 41.2 | 0.55 |
| 38.9 | 2.35 | 41.3 | 0.52 |
| 55.0 | 2.20 | 42.1 | 0.89 |

a. $\quad \mathrm{Br}_{\mathrm{m}}=\left(\% 16-\mathrm{ArBr}_{\mathrm{N}}-10.38\right) / 11.04$
b. $\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}}=S_{\mathrm{w}}{ }^{\mathrm{Br}} \mathrm{x} \mathrm{Br} \mathrm{m}_{\mathrm{m}}\left(\% 16-\mathrm{ArOH}_{\mathrm{N}}\right) /\left(\% 16-\mathrm{ArBr}_{\mathrm{N}}\right)$
c. $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}=\mathrm{H}_{2} \mathrm{O}_{\mathrm{m}} \times\left(\% 16-\mathrm{ArOOc}_{\mathrm{N}}\right) /\left[S_{\mathrm{w}}{ }^{\mathrm{ROH}} \mathrm{x}\left(\% 16-\mathrm{ArOH}_{\mathrm{N}}\right)\right] ; S_{\mathrm{w}}{ }^{\mathrm{ROH}} \approx 1$ according to ref ${ }^{1}$.
d. The values in the bracket are the standard deviation obtained from three parallel experiments.

## Section VI: Packing parameter estimation

Table S4. Estimated values of interfacial CTAB molarities, $\mathrm{CTAB}_{\mathrm{m}}$, interfacial $\mathrm{C}_{4} \mathrm{OH}$ molarities, $\mathrm{C}_{4} \mathrm{OH}_{\mathrm{m}}$, faction of CTAB in the mixed micelle, $\alpha(\mathrm{CTAB})$, fraction of $\mathrm{C}_{4} \mathrm{OH}$ in the mixed micelle, $\alpha\left(\mathrm{C}_{4} \mathrm{OH}\right)$, weighted effective headgroup area, $a_{0}$, weighted tail volume, $\mathrm{V}_{\mathrm{H}}$, weighted tail length, $\mathrm{l}_{\mathrm{c}}$, packing parameter for mixed aggregates, P , in aqueous solutions of $0.1 \mathrm{M} \mathrm{CTAB} / 0.1 \mathrm{M} \mathrm{KBr}$ containing $10.9-54.6 \mathrm{mM}$ $\mathrm{C}_{4} \mathrm{OH}$ at $25^{\circ} \mathrm{C}$. $(\beta=0.75)$

| $\left[\mathrm{C}_{4} \mathrm{OH}\right]$ <br> $(\mathrm{mM})$ | $\mathrm{CTAB}_{\mathrm{m}}$ <br> $(\mathrm{M})$ | $\mathrm{C}_{4} \mathrm{OH}_{\mathrm{m}}$ <br> $(\mathrm{M})$ | $\alpha(\mathrm{CTAB})$ | $\alpha\left(\mathrm{C}_{4} \mathrm{OH}\right)$ | $\mathrm{a}_{0}$ <br> $\left(\mathrm{~nm}^{2}\right)$ | $\mathrm{V}_{\mathrm{H}}$ <br> $\left(\mathrm{nm}^{3}\right)$ | $\mathrm{l}_{\mathrm{c}}$ <br> $(\mathrm{nm})$ | P |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 3.59 | 0 | 1.00 | 0.00 | 0.54 | 0.46 | 2.17 | 0.39 |
| 10.9 | 3.67 | 0.06 | 0.98 | 0.02 | 0.53 | 0.45 | 2.15 | 0.40 |
| 21.8 | 3.67 | 0.14 | 0.96 | 0.04 | 0.52 | 0.45 | 2.12 | 0.40 |
| 32.8 | 3.61 | 0.18 | 0.95 | 0.05 | 0.52 | 0.44 | 2.10 | 0.41 |
| 43.7 | 3.59 | 0.23 | 0.94 | 0.06 | 0.51 | 0.44 | 2.08 | 0.41 |
| 54.6 | 3.55 | 0.29 | 0.92 | 0.08 | 0.51 | 0.43 | 2.06 | 0.42 |

Table S5. Estimated values of interfacial CTAB molarities, $\mathrm{CTAB}_{\mathrm{m}}$, interfacial $\mathrm{C}_{8} \mathrm{OH}$ molarities, $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}$, faction of CTAB in the mixed micelle, $\alpha(\mathrm{CTAB})$, fraction of $\mathrm{C}_{8} \mathrm{OH}$ in the mixed micelle, $\alpha\left(\mathrm{C}_{8} \mathrm{OH}\right)$, weighted effective headgroup area, $\mathrm{a}_{0}$, weighted tail volume, $\mathrm{V}_{\mathrm{H}}$, weighted tail length, $1_{\mathrm{c}}$, packing parameter for mixed aggregates, P , in aqueous solutions of $0.1 \mathrm{M} \mathrm{CTAB} / 0.1 \mathrm{M} \mathrm{KBr}$ containing $0-55 \mathrm{mM} \mathrm{C}_{8} \mathrm{OH}$ at $25^{\circ} \mathrm{C} .(\beta=0.75)$

| $\left[\mathrm{C}_{8} \mathrm{OH}\right]$ <br> $(\mathrm{mM})$ | $\mathrm{CTAB}_{\mathrm{m}}$ <br> $(\mathrm{M})$ | $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}$ <br> $(\mathrm{M})$ | $\alpha(\mathrm{CTAB})$ | $\alpha\left(\mathrm{C}_{8} \mathrm{OH}\right)$ | $\mathrm{a}_{0}$ <br> $\left(\mathrm{~nm}^{2}\right)$ | $\mathrm{V}_{\mathrm{H}}$ <br> $\left(\mathrm{nm}^{3}\right)$ | $\mathrm{l}_{\mathrm{c}}$ <br> $(\mathrm{nm})$ | P |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 3.59 | 0 | 1.00 | 0.00 | 0.54 | 0.46 | 2.17 | 0.39 |
| 6.35 | 3.53 | 0.15 | 0.96 | 0.04 | 0.52 | 0.45 | 2.13 | 0.40 |
| 12.7 | 3.48 | 0.2 | 0.95 | 0.05 | 0.52 | 0.45 | 2.12 | 0.41 |
| 15.9 | 3.44 | 0.22 | 0.94 | 0.06 | 0.51 | 0.45 | 2.11 | 0.41 |
| 19 | 3.39 | 0.26 | 0.93 | 0.07 | 0.51 | 0.44 | 2.10 | 0.42 |
| 22.2 | 3.33 | 0.31 | 0.91 | 0.09 | 0.50 | 0.44 | 2.09 | 0.42 |
| 25.4 | 3.29 | 0.40 | 0.89 | 0.11 | 0.49 | 0.43 | 2.06 | 0.43 |
| 31.8 | 3.19 | 0.48 | 0.87 | 0.13 | 0.48 | 0.43 | 2.04 | 0.44 |
| 34.9 | 3.15 | 0.55 | 0.85 | 0.15 | 0.47 | 0.43 | 2.02 | 0.45 |
| 38.9 | 3.13 | 0.52 | 0.86 | 0.14 | 0.47 | 0.43 | 2.03 | 0.44 |
| 55 | 2.93 | 0.89 | 0.77 | 0.23 | 0.43 | 0.41 | 1.94 | 0.49 |

Table S6. Estimated values of interfacial CTAB molarities, $\mathrm{CTAB}_{\mathrm{m}}$, interfacial $\mathrm{C}_{8} \mathrm{OH}$ molarities, $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}$, faction of CTAB in the mixed micelle, $\alpha(\mathrm{CTAB})$, fraction of $\mathrm{C}_{8} \mathrm{OH}$ in the mixed micelle, $\alpha\left(\mathrm{C}_{8} \mathrm{OH}\right)$, weighted effective headgroup area, $a_{0}$, weighted tail volume, $\mathrm{V}_{\mathrm{H}}$, weighted tail length, $\mathrm{l}_{\mathrm{c}}$, packing parameter for mixed aggregates, P , in aqueous solutions of $0.1 \mathrm{M} \mathrm{CTAB} / 0.1 \mathrm{M} \mathrm{KBr}$ containing $0-55 \mathrm{mM} \mathrm{C}_{8} \mathrm{OH}$ at $25^{\circ} \mathrm{C}$. $(\beta=1)$

| $\left[\mathrm{C}_{8} \mathrm{OH}\right]$ <br> $(\mathrm{mM})$ | $\mathrm{CTAB}_{\mathrm{m}}$ <br> $(\mathrm{M})$ | $\mathrm{C}_{8} \mathrm{OH}_{\mathrm{m}}$ <br> $(\mathrm{M})$ | $\alpha(\mathrm{CTAB})$ | $\alpha\left(\mathrm{C}_{8} \mathrm{OH}\right)$ | $\mathrm{a}_{0}$ <br> $\left(\mathrm{~nm}^{2}\right)$ | $\mathrm{V}_{\mathrm{H}}$ <br> $\left(\mathrm{nm}^{3}\right)$ | $\mathrm{l}_{\mathrm{c}}$ <br> $(\mathrm{nm})$ | P |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 2.69 | 0 | 1.00 | 0.00 | 0.54 | 0.46 | 2.17 | 0.39 |
| 6.35 | 2.65 | 0.15 | 0.95 | 0.05 | 0.52 | 0.45 | 2.12 | 0.41 |
| 12.7 | 2.61 | 0.2 | 0.93 | 0.07 | 0.51 | 0.44 | 2.10 | 0.42 |


| 15.9 | 2.58 | 0.22 | 0.92 | 0.08 | 0.50 | 0.44 | 2.09 | 0.42 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 19 | 2.54 | 0.26 | 0.91 | 0.09 | 0.50 | 0.44 | 2.08 | 0.42 |
| 22.2 | 2.50 | 0.31 | 0.89 | 0.11 | 0.49 | 0.43 | 2.06 | 0.43 |
| 25.4 | 2.47 | 0.4 | 0.86 | 0.14 | 0.48 | 0.43 | 2.03 | 0.44 |
| 31.8 | 2.39 | 0.48 | 0.83 | 0.17 | 0.46 | 0.42 | 2.00 | 0.45 |
| 34.9 | 2.36 | 0.55 | 0.81 | 0.19 | 0.45 | 0.42 | 1.98 | 0.46 |
| 38.9 | 2.35 | 0.52 | 0.82 | 0.18 | 0.46 | 0.42 | 1.99 | 0.46 |
| 55 | 2.20 | 0.89 | 0.71 | 0.29 | 0.41 | 0.40 | 1.88 | 0.52 |

The equations used to calculate the above values were as follow:
$\mathrm{CTAB}_{\mathrm{m}}=\mathrm{Br}_{\mathrm{m}} / \beta\left(\mathrm{Br}_{\mathrm{m}}\right.$ are estimated from CT experiments $)$
$\alpha(\mathrm{CTAB})=\mathrm{CTAB}_{\mathrm{m}} /\left(\mathrm{CTAB}_{\mathrm{m}}+\mathrm{C}_{\mathrm{n}} \mathrm{OH}_{\mathrm{m}}\right)\left(\mathrm{n}=4\right.$ or $8 ; \mathrm{C}_{\mathrm{n}} \mathrm{OH}_{\mathrm{m}}$ are estimated from CT experiments $)$
$\alpha\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right)=1-\alpha(\mathrm{CTAB}) \quad(\mathrm{n}=4$ or 8$)$
$\mathrm{a}_{0}=\mathrm{a}_{0}(\mathrm{CTAB}) * \alpha(\mathrm{CTAB})+\mathrm{a}_{0}\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right) * \alpha\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right) \quad(\mathrm{n}=4$ or 8$)$
$\mathrm{V}_{\mathrm{H}}=\mathrm{V}_{\mathrm{H}}(\mathrm{CTAB}) * \alpha(\mathrm{CTAB})+\mathrm{V}_{\mathrm{H}}\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right) * \alpha\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right)(\mathrm{n}=4$ or 8$)$
$1_{c}=1_{c}(\mathrm{CTAB}) * \alpha(\mathrm{CTAB})+1_{\mathrm{c}}\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right) * \alpha\left(\mathrm{C}_{\mathrm{n}} \mathrm{OH}\right) \quad(\mathrm{n}=4$ or 8$)$
$\mathrm{P}=\mathrm{V}_{\mathrm{H}} /\left(\mathrm{a}_{0} \mathrm{l}_{\mathrm{c}}\right)$

## Reference

1. J. Yao, L. S. Romsted, Langmuir, 2000, 16, 8771-8779.
