Supplementary material

1 Raw data of the conductivity

Figure 1: Conductivity of pure catanionic solutions at different ratio of anionic surfactant \( r \).

Conductivity [\mu S/cm]

0 100 200 300 400 500 600 700

0.3 0.4 0.5 0.6 0.7

Conductivity vs. \( r \)
2 Calculation of the surface tension for catanionics adsorbed at the air-water interface

\[ \sigma_{r,A} = \sigma_{r,A}(\text{dispersion}) + \sigma_{r,A}(\text{polar}) \quad (1) \]

and

\[ \sigma_{r,T} = \sigma_{r,A} + \sigma_{T,A} - 2\sqrt{\sigma_{r,A}(\text{dispersion})\sigma_{T,A}(\text{dispersion})} \quad (2) \]

where \( \sigma_{T,A} = \sigma_{T,A}(\text{dispersion}) \) and \( \sigma_{T,A}(\text{polar}) = 0 \).

The surface tension of tetradecane is \( \sigma_{T,A} = 26.6 \) mN/m and the interfacial tension of tetradecane-water is \( \sigma_{T,W} = 52.9 \) mN/m.

From equation 2 it follows that \( \sigma_{r=0.4,A}(\text{dispersion}) = 21.3 \pm 1 \) mN/m, \( \sigma_{r=0.4,A}(\text{polar}) = 3.7 \pm 1 \) mN/m, \( \sigma_{r=0.6,A}(\text{dispersion}) = 22.7 \pm 1 \) mN/m, and \( \sigma_{r=0.6,A}(\text{polar}) = 3.3 \pm 1 \) mN/m.

Finally from equation 3,\(^1\)

\[ \sigma_{r,W} = \sigma_{r,A} + \sigma_{W,A} - 2\sqrt{\sigma_{r,A}(\text{dispersion})\sigma_{W,A}(\text{dispersion})} - 2\sqrt{\sigma_{r,A}(\text{polar})\sigma_{W,A}(\text{polar})} \quad (3) \]

where \( \sigma_{W,A}(\text{dispersion}) = 21.5 \) mN/m and \( \sigma_{W,A}(\text{polar}) = 50.4 \) mN/m, one can calculate \( \sigma_{r=0.4,W} = 26.8 \pm 1 \) mN/m and \( \sigma_{r=0.6,W} = 27.9 \pm 1 \) mN/m.

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1. Supplementary Material (ESI) for Soft Matter. This journal is © The Royal Society of Chemistry 2011.
References