Suplementary information (S2)

The model described in the paper implies four adjustable parameters to be determined from the dynamical surface tension data : $k^{0}{}_{ads}^{trans}, k^{0}{}_{ads}^{cis}, k_{des}^{trans}, k_{des}^{cis}$. Let us briefly describe here the strategy that enables us to discriminate the parameters from each other to make sure they are determined independently as much as possible. Let us recall that in Section 3, we found qualitatively that for a similar concentration of trans but different total amount of surfactants (hence a different amount of cis isomers) in the solution, the adsorption of cis isomers at short times has to be considered. However at longer times, cis isomers seem to be replaced by trans isomers, which adsorb preferentially at the interface. From these observations, in a first approximation one can assume that the cis and trans conformers adsorb at a similar rate so that $k_{ads}^{cis} \approx k_{ads}^{trans}$. At long times, the final surface tension is mainly fixed by the trans concentration, so we deduce that $\left(\frac{k_{ads}^{cis}}{k_{des}^{cis}}\right) << \left(\frac{k_{ads}^{trans}}{k_{des}^{trans}}\right)$. From these qualitative results, we simplify the model to characterize first the adsorption dynamics of the trans isomer. We obtain a rough starting value of k_{ads}^{trans} and k_{des}^{trans} from the fit of the curves corresponding to λ= 436 nm in Figure 3, where the trans are the dominant surfactant. Indeed, the fit at short times enables to obtain k_{ads}^{trans} and the value of the long-time surface tension enables controls the ratio of the adsorption and desorption constants of the trans isomers, $\left(\frac{k_{ads}^{trans}}{k_{des}^{trans}}\right)$. Then to obtain a rough estimation of k_{ads}^{cis} and k_{des}^{cis}, we use the surface tension curve obtained for a solution of prepared under UV leading to a trans concentration of 0.92mM. This curve enables to better evaluate the role of the cis isomers as their concentration is 5 times higher than the trans (c_{cis}/c_{trans}=5.25). The ratio of constant of

adsorption of $\frac{k_{ads}^{cis}}{k_{ads}^{trans}}$ is determined precisely from the value of the surface tension at early times whereas the ratio $\frac{k_{des}^{cis}}{k_{des}^{trans}}$ is obtained from the difference of surface tension at long times between the curves at constant trans concentration. Finally this set of parameters is optimized once gaian to obtain the values given in the article.