

Supporting Information

Evaporation of Sessile Droplets of Dilute Aqueous Solutions Containing Sodium n-Alkylates from Polymer Surfaces: Influences of Alkyl Length and Concentration of Solute

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1. Experiments

Variations in surface pressure with mean molecular area were measured in a Langmuir-Blodgett (LB) trough (KSV 2000). Solutions of sodium n-alkylates at concentrations of 0.5 mg/mL were prepared in a mixture of chloroform and methanol (8:2 v/v). The subphase was deionized water. The sodium n-alkylate solutions (200 μ L) were deposited on the subphase using a microsyringe. The isotherm curves of surface pressure versus mean molecular weight were obtained with a compression rate of 5 mm/min at room temperature. Each mean molecular area was calculated using the molecular weights of the sodium n-alkylates employed.

2. Isotherm Curves of Surface Pressure versus Mean Molecular Area for Sodium n-Alkylates

Figure S1 shows the isotherm curves of surface pressure versus mean molecular area for the sodium n-alkylates studied. Although both sidebars of the LB-trough compressed to the Wilhelmy plate (i.e., the experimental limit), the isotherm surface pressures did not increase for C₃, C₆, or C₁₀. However, the isotherm surface pressure of C₁₂ increased sharply at a particular mean molecular area, compressing the surface area, indicating that only C₁₂ was located at the air/water interface in this study.

The dramatic increment of surface pressure shown in LB isotherm curve indicates a good arrangement of the amphiphilic materials via packing on the interface between air and water interface. As pressure increases, the packing of floating materials become more tightened until it reaches a collapsed point. And this point of area/molecule means the hydrophilic part's head size of the materials. However, in case of the sodium dodecanoate, it is not easy to find the precise base line of the isotherm curve at least in our LB trough because this material has a low molecular weight, density and very small size which might be able to cause a negative pressure of the base line as shown in Figure S1. But it is obvious that sodium dodecanoate shows a sharp offset and increment of surface pressure, so it can be inferred that the probability of finding amphiphilic material on the interface of water and hydrophobic air gets higher as the hydrophobic chain becomes longer.

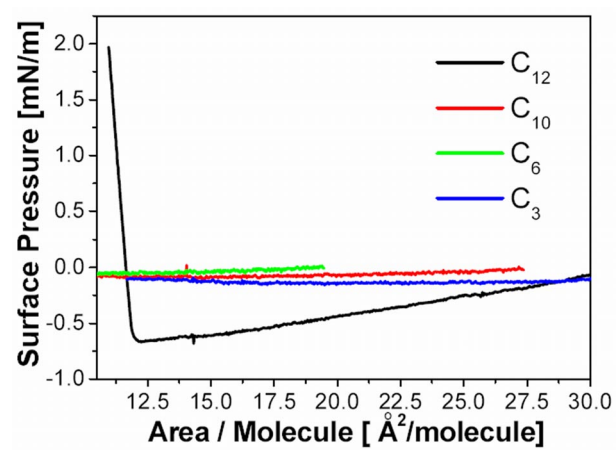


Figure S1. Isotherm curves of surface pressure versus mean molecular area for the sodium n-alkylates studied.