

Electronic Supplementary Information (ESI): Isostructural solid-solid phase transition in monolayers of soft core-shell particles at fluid interfaces: structure and mechanics

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1 Supplementary Data

1.1 2D phase diagrams: expansion and deposition

In Figure 1, the expansion isotherm of the microgels Π versus local measured A_p is shown. Each data point corresponds to different positions on the substrate, which was lifted through the interface during expansion starting from different initial amounts of spread microgels at 0.1 wt%. The dashed lines define the five different regimes of the phase transition identified upon compression, as described in the main text. The letters indicate at which surface pressures the AFM images next to the graph were taken. As it can be noted, the same type of isotherm is recorded and the different regimes display the same interface microstructure as upon compression. Figure 2 shows the comparison between the compression/expansion isotherms and a quantitative comparison between the structural parameters described in the main text. The agreement in the data is evident. The only significant qualitative difference is that monolayers cannot be directly prepared in Region V, as saturation of the interface with a core-core, close packed monolayer prevents the observation of buckled interfaces before starting the expansion.

1.2 Frequency sweeps at the interface

In addition to the amplitude sweeps reported in the main text, Figure 3 shows frequency sweeps corresponding to different values of the surface pressure at the a/w interface. The frequency of 0.5Hz used for the amplitude sweeps is in the linear regime.

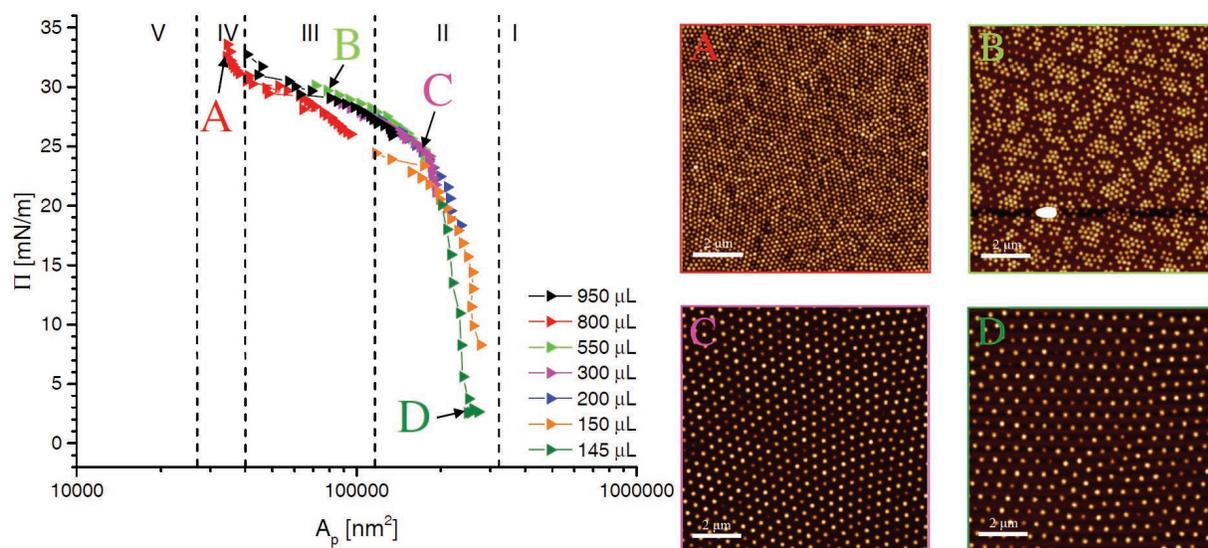


Fig. 1 Expansion isotherm of the microgels, obtained from seven individual measurements (indicated by the different colors of the curves) with varying microgel amounts. The dashed lines correspond to the regimes identified upon compression. AFM images taken on different substrates at different surface pressures. The surface pressure decreases from A to D. The scan size was $10 \times 10 \mu\text{m}^2$.

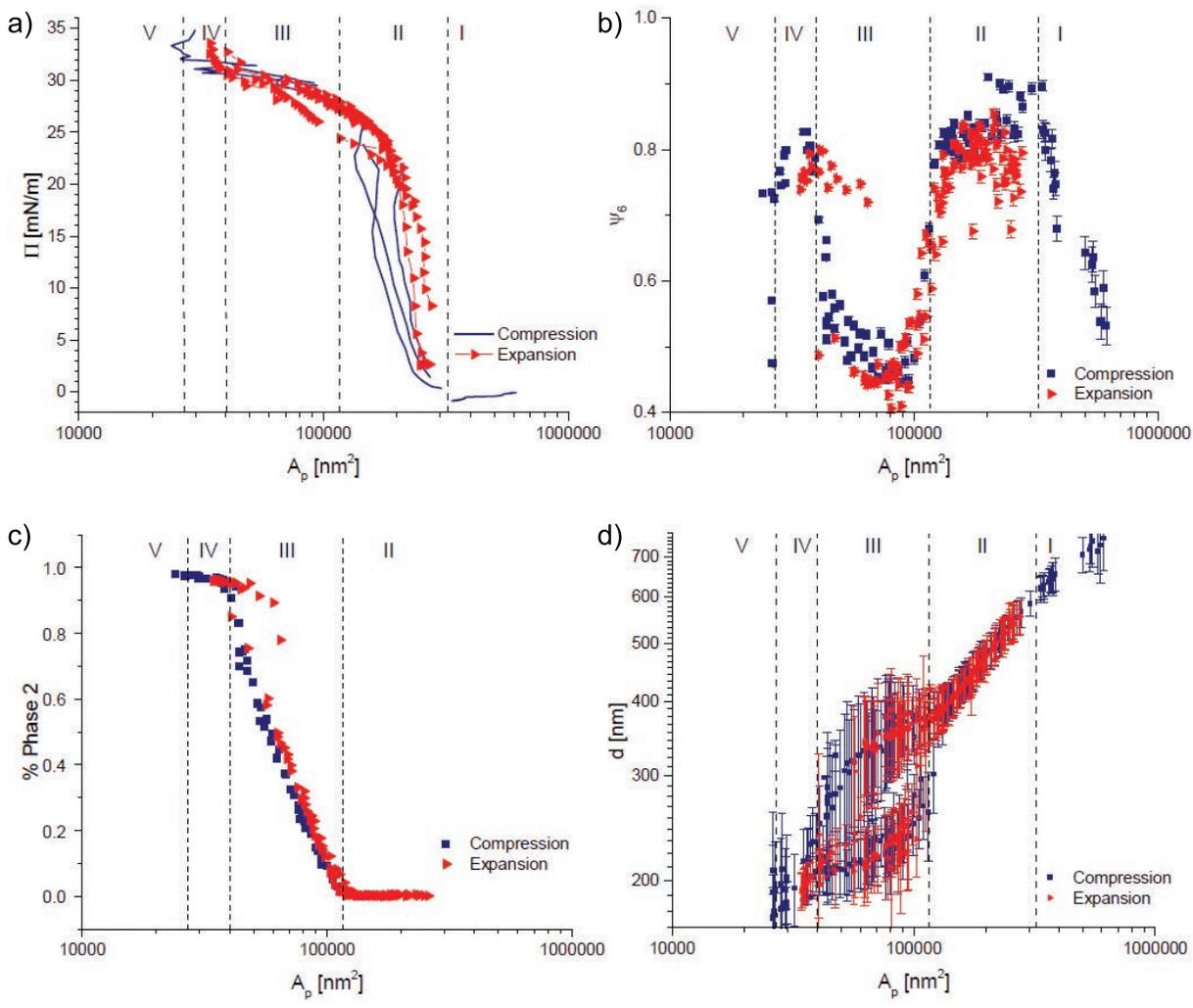


Fig. 2 Comparison of the microgel behavior at the hexane/water interface during compression (blue) and expansion (red). The surface pressure (a), the ψ_6 parameter (b), the percentage of the close-packed phase (c) and the average distance between neighboring particles (d) are plotted versus the area per particle. The dashed lines correspond to the regimes identified upon compression.

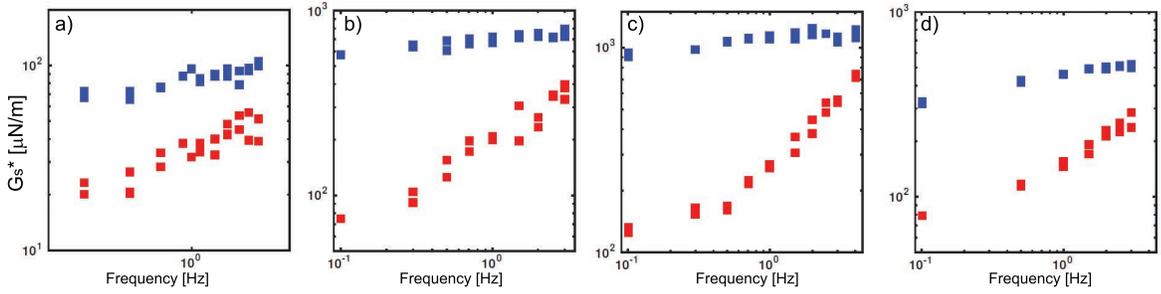


Fig. 3 Frequency sweeps of the microgel-laden a/w interfaces with the microdisk rheometer at various values of surface pressure: a) 6.6 mN/m; b) 14.6 mN/m; c) 23.4 mN/m; d) 30.1 mN/m. Blue symbols indicate the elastic surface modulus G'_s and red ones indicate the loss surface modulus G''_s .