

Supporting Information

Specific Effects of Ca²⁺ Ions and Molecular Structure of β -Lactoglobulin Interfacial Layers that Drive Macroscopic Foam Stability

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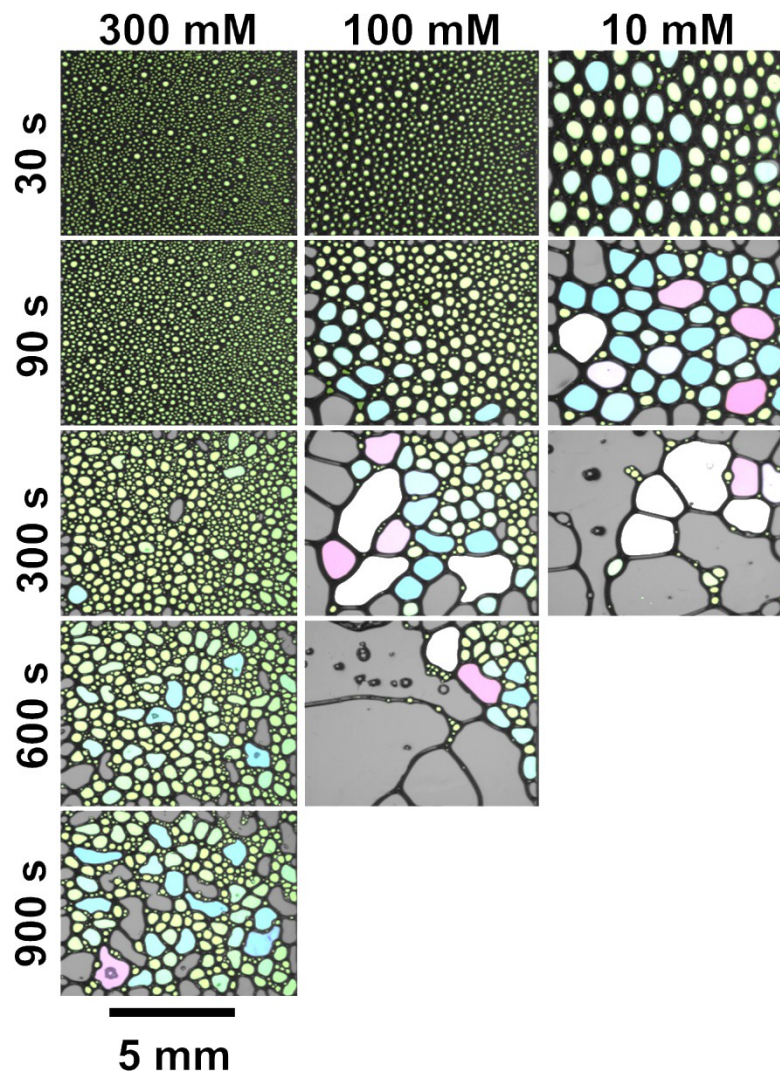


Figure S1 Structure and aging of macroscopic foam from 15 μM β -lactoglobulin solutions with 300, 100 and 10 mM CaCl_2 concentrations. Foam age was as indicated, 30 s indicate that time after the gas flow was stopped. The lateral resolution was for images identical and is as indicated in the top left image. Bubbles are false colour coded for certain size fractions.

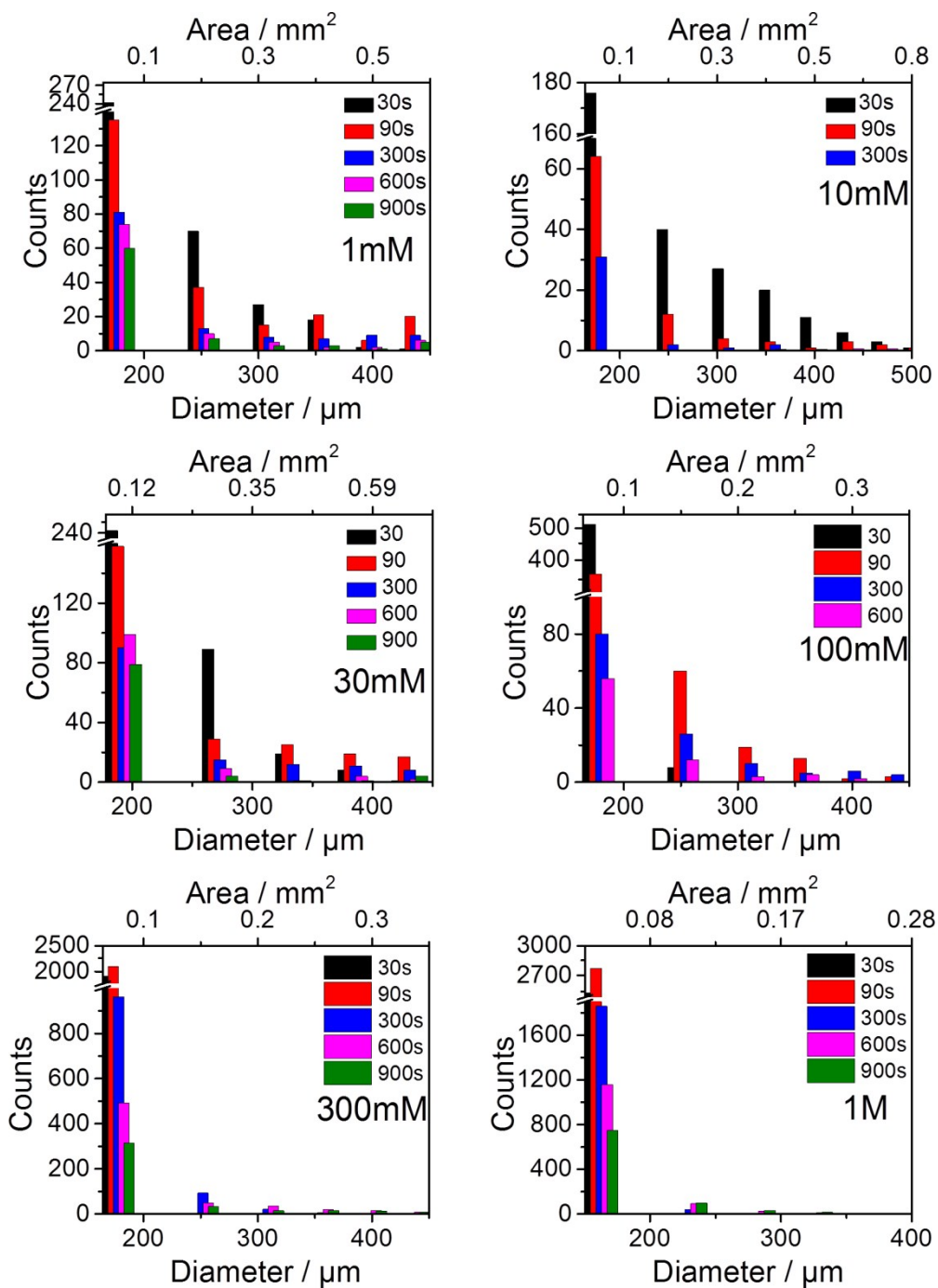


Figure S2 Bubble size distributions for macroscopic foam from 15 μM β -lactoglobulin solutions with different CaCl_2 concentrations and as a function of foam age as indicated in the Figure.

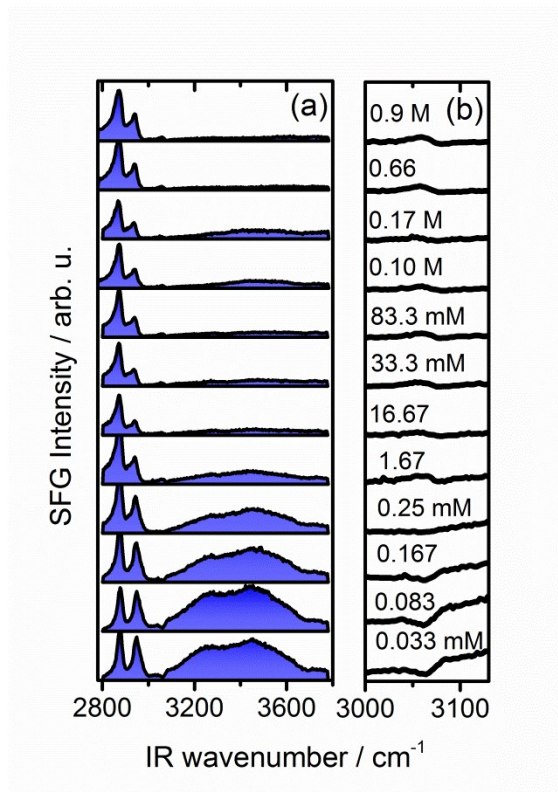


Figure S3. Second set of vibrational SFG spectra from β -lactoglobulin (BLG) modified air-water interfaces as a function of Ca^{2+} concentration. (a) shows the C-H and O-H stretching region (b) shows the region that is dominated by the aromatic C-H stretching mode. Note that we use the interference of this band with the O-H stretching bands to determine the polarity of the interfacial net charge. For further discussions see main text.

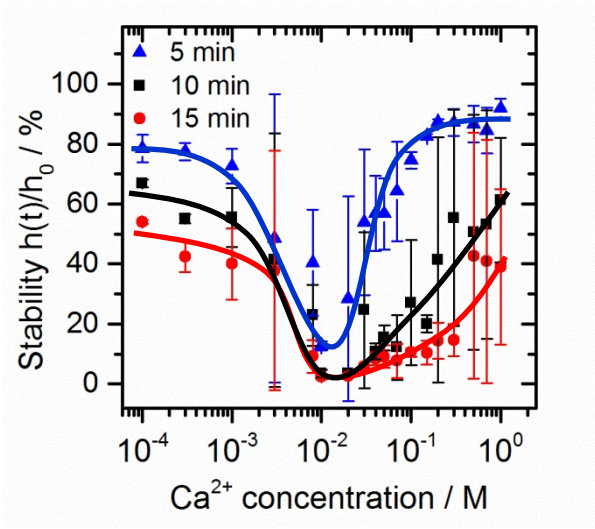


Figure S4. Foam stability of 15 μM β -lactoglobulin (BLG) solutions with different CaCl_2 concentrations and as a function of foam age as indicated in the Figure, determined by evaluation of foam heights $h(t)$ at different times relative to the initial foam height h_0 . Lines are a guide to the eye.

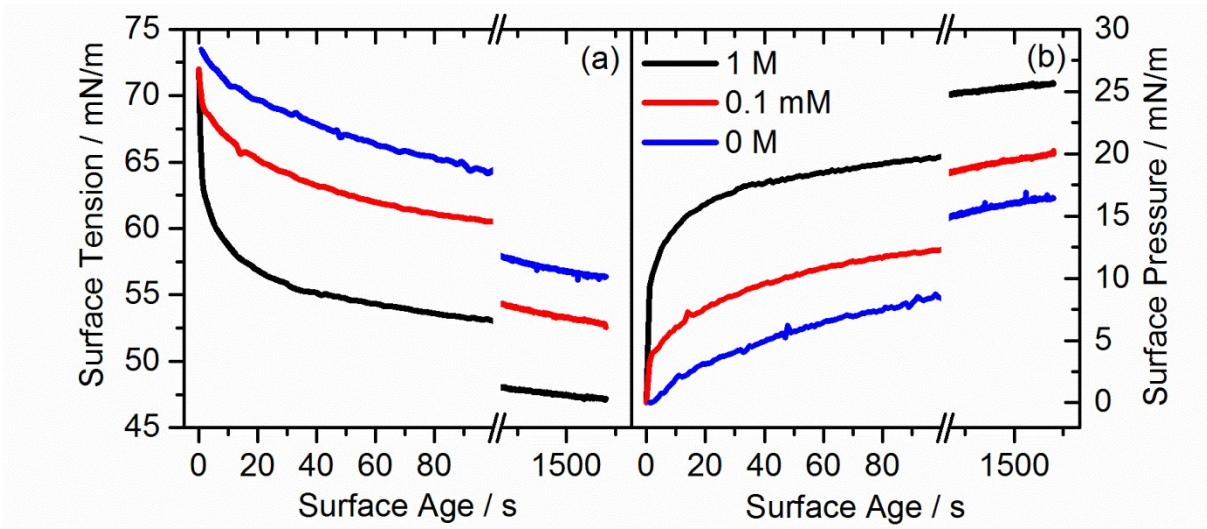


Figure S5. Surface tension (a) and surface pressure (b) of 15 μM β -lactoglobulin (BLG) solutions for different CaCl_2 concentrations as a function of surface age.