

Supplementary Information

Liquid Crystal Microcapillary-Based Sensors for Affordable Analytical Applications

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Equilibrium Configuration of LC Compartment, Four-Petal Appearance

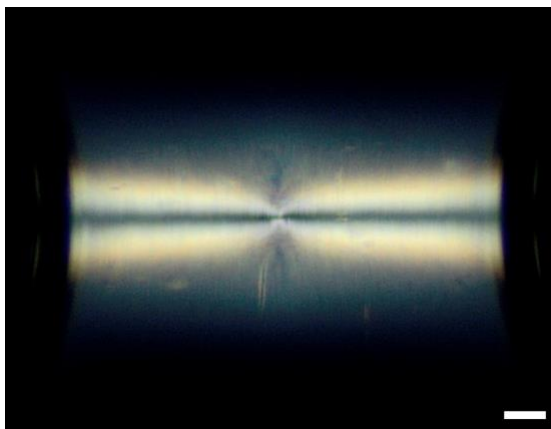


Fig. S1. Equilibrium configuration of LC compartment inside microcapillary with high exposure time to observe dark vertical and horizontal lines crossing through the point defect. Scale bar: 100 μm .”

Effect of Diffusion Path Length

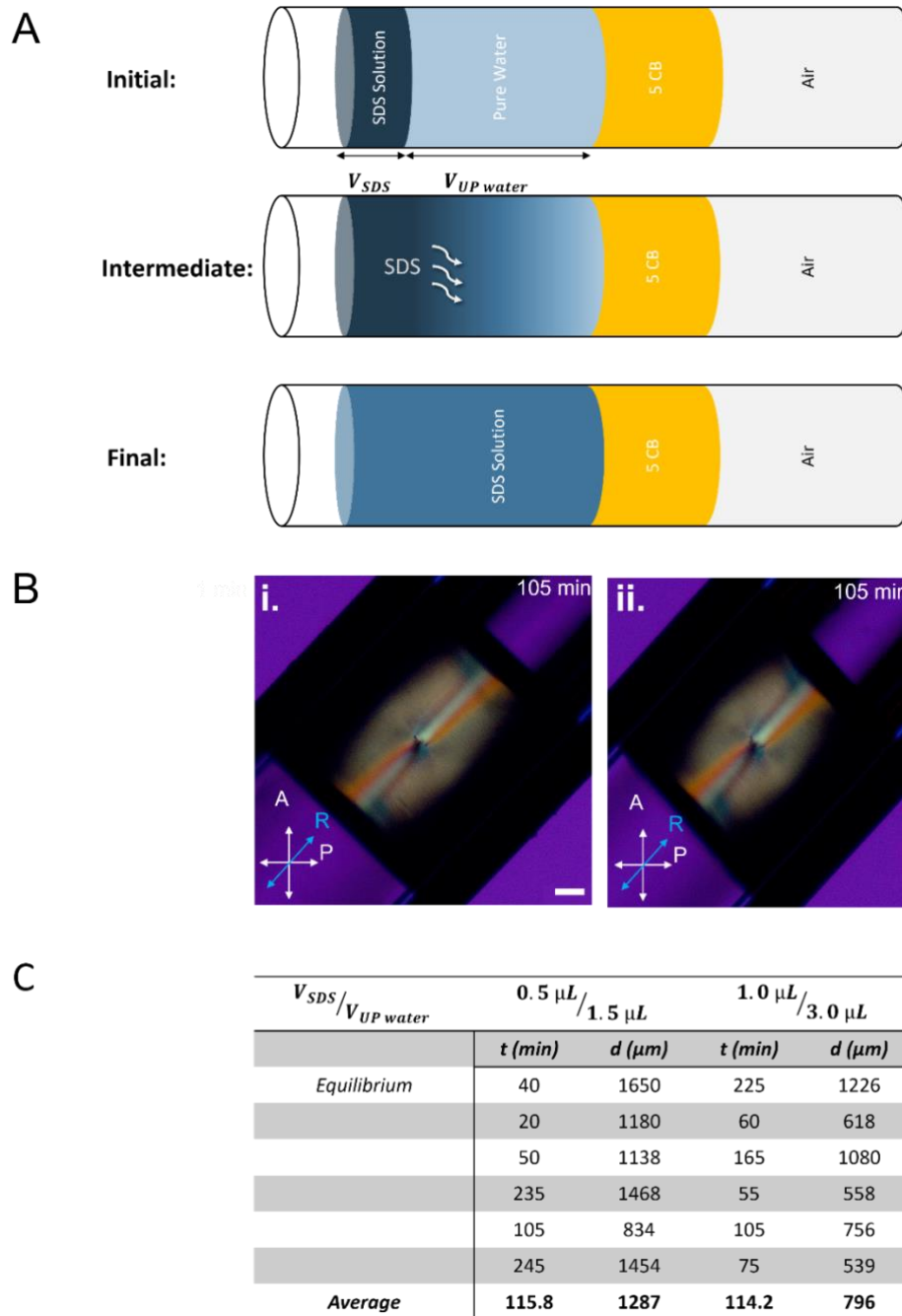


Fig. S2. Diffusion and equilibrium time analysis with the systems where one side of the LC phase was opened to atmosphere; (A) Schematic representation of experimental setup, (B) 45° angled POM images of LC compartments where aqueous SDS solution/UP water volumes were (i.) 0.5 μ L/1.5 μ L and (ii.) 1.0 μ L/3.0 μ L. (C) Equilibrium times for each volume ratios, d represents the LC compartment size. Scale bar: 100 μ m.

Analysis with Cationic Surfactant Solution (CTAB)

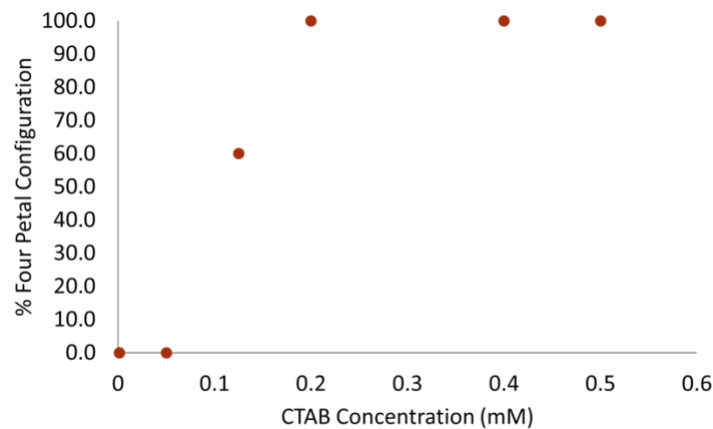


Fig. S3. Distribution of overall number of experiments that four petal shape is observed with various concentrations of CTAB solution.

Control Experiments for Purification Process

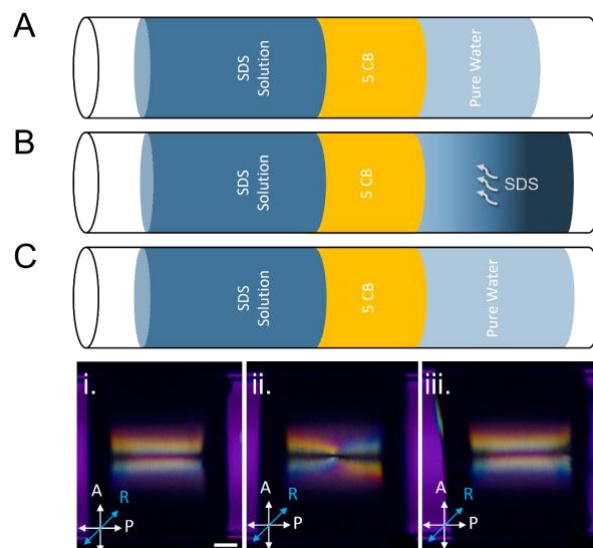


Fig. S4. Schematic representations (A,B,C) and polarized optical micrographs (i, ii, iii) of (A, i) the initial step of the control experiments prior to purification process, LC compartment contacting with 1.25 mM aqueous SDS solution at one side and UP water on the other side, (B, ii) the equilibrium state when the both sides of the LC compartment contacting with 1.25 mM aqueous SDS solution, (C, iii) the equilibrium state when the LC compartment contacting with UP water at one side and 1.25 mM aqueous SDS solution at the other side again, after purification process. Scale bar: 100 μ m.

Determination of SDS Diffusion in LC Phase

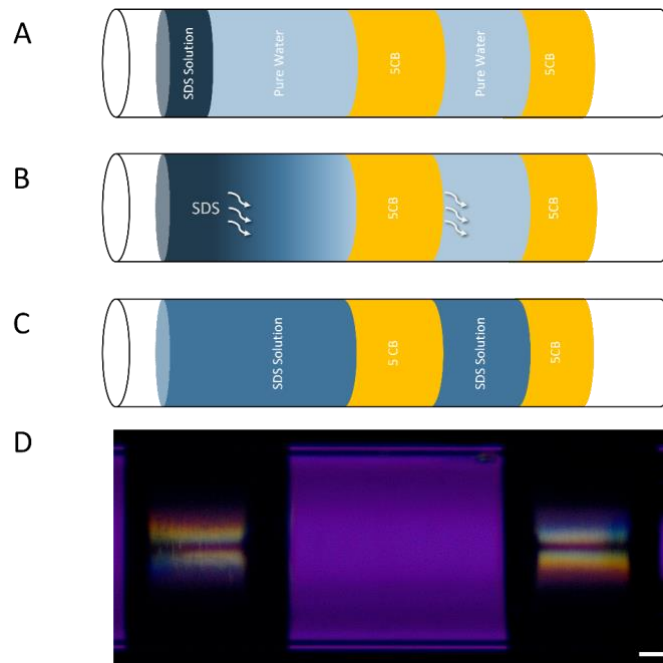


Fig. S5. Experimental setup for the determination of SDS diffusion in LC phase: (A) initial, (B) intermediate, (C) final, and (D) POM images of both the LC compartments in final state. Scale bar: 100 μm .

Video S1. Sequential polarized optical micrographs of nematic LC compartment which shows the continuous motion of the defect until it reached equilibrium. Images were collected during transition state while LC was contacting with 2.5 mM SDS solution at both sides.