

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Fluid and Materials Sciences (2)

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SURFACTANT TRANSFER BETWEEN THE DROP CONNECTED TO RESERVOIR AND
SURROUNDING FLUID**Abstract**

The paper presents the results of experimental research of surfactant diffusion from a drop of the binary mixture to a surrounding liquid under terrestrial conditions. The droplet is coupled with the reservoir filled with the source mixture through a long thin tube (needle). A decrease of surfactant concentration in the drop was found to provoke its diffusion from the needle. The ejection of the surfactant initiated a capillary flow, which, in turn, contributed to the formation of a large-scale structure of the fluid motion in the drop. The comparative contribution of the capillary and gravitational mechanisms of motion was estimated. Visualization of the flow patterns and concentration fields has shown that surfactant diffusion from the needle leads to the onset of the oscillatory mode of the capillary convection in the drop. The frequency of the outbursts of the Marangoni convection, the lifetime of the oscillatory flow modes and the amount of the initial mixture involved in the process of mass transfer depended on the drop size and initial concentration of the surfactant. The obtained results are compared with the cases of surfactant diffusion from the secluded drop in terrestrial conditions and from the drop emerging from the reservoir in microgravity. The work was supported by Research program of Ural Branch of RAS 10 (project 12--1-1008) and the program for International Research Teams of the Ministry of Science and Education of Perm region (project -26/210).