

EXPERIMENTAL STUDY OF THE VIBRATION EFFECT ON THE WETTING HYSTERESIS AND CAPILLARY FLUID MOTIONS

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Abstract

The results of experiments on the study of the fluid motion in the capillary systems and on the vibration effect are presented. The data on the meniscus shape and the height of capillary rise when the fluid is advancing or receding are obtained. The rate of capillary rise is measured. Emissions of liquid droplets from the surface of the meniscus are visually observed at vibration. It is determined that vibration practically completely eliminates the ordinal hysteresis in capillaries. Mechanisms of collapsing of the capillary bridges between particles of the dispersed layer at vibrations are determined. It is shown that these mechanisms differ for low and high vibration frequencies. For horizontal and vertical capillary bridges the critical values of frequencies and acceleration of vibration, at which the capillary bridge becomes unstable and collapses, are identified. These values for short capillary bridges do not depend on their spatial orientation. For longer capillary bridges, difference is observed.