

# HETEROGENEOUS NUCLEATION IN A LIQUID IN THE PRESENCE OF INCLUSIONS WITH DIFFERENT WETTABILITY

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The aim of the work is to identify common patterns that lead to a decrease in the rapture thresholds of real liquids – the thresholds of acoustic cavitation and laser thermal cavitation. The role of bubbles, small inclusions, and extended surfaces with pores and cracks with different liquid wettability as a source of cavitation is discussed. The influence of the wettability of inclusions on the overheating thresholds and cavitation strength of liquids is analyzed and the mutual role of the dimensions and the angle of wettability of individual inclusions is revealed. The role of heterophase fluctuations in the formation of critical nuclei in the presence of inclusions with different wettability is discussed and a range of inclusion characteristics is identified when the mechanism of heterophase fluctuations must be taken into account when determining overheating or cavitation thresholds. It is shown that the presence of non-wettable objects dramatically reduces the cavitation strength of liquids. A special effect is observed in the presence of rough surfaces with hydrophobic pores. Porous hydrophobic surfaces lead to a sharp decrease in cavitation strength, while spontaneous drainage of pores is possible with certain combinations between the wetting edge angle and the size and shape of the pore, on the one hand, and the amount of applied external pressure (or external heating) of the liquid, on the other hand.

**Keywords:** cavitation, bubbles, nucleation, wettability, heterophase fluctuations, laser thermal cavitation

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