

# SURFACE TENSION OF LIQUID MERCURY IN VACUUM, IN THE MEDIUM OF OXYGEN. EXPERIMENT

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The operation of various devices and technical devices with mercury is carried out in a variety of conditions, so the study of the influence of the gaseous medium and vapors on the thermal properties of Hg remains an urgent task. But in the literature there are not enough reliable data that allow one to unequivocally judge the degree of influence of oxygen on the surface tension (ST) of mercury [1]. In this connection, in the present paper, the problem of the experimental study of the effect of air and oxygen on the surface tension of high-purity mercury at room temperatures is posed and is being solved. The experiments used mercury grade P-0 with a content of 99.9997% Hg. Before the measurements of the ST, the mercury was subjected to high-vacuum distillation and "distilled" it into glass ampoules, which were then soldered to the measuring cell, by the known method of a large drop. To prevent the mercury from sputtering and contacting it with atmospheric air inside the ampoule, mercury was blocked by a thin hemispherical glass partition, and a metal "firing pin" was placed in a glass "shirt" for subsequent opening of the ampoule with Hg in a vacuum inside the measuring cell itself. Similarly, glass ampoules of about 0.2 liter capacity were prepared, which, after preliminary heat treatment in high vacuum, were filled with certified atmospheric air or oxygen and also were soldered to a measuring cell. The results of measuring the effect of oxygen on the mercury surface tension at 293 K, obtained in a continuous mode in a vacuum (1180 min) and an oxygen atmosphere (1460 min) on the same surface of the Hg drop, indicate that under vacuum conditions the surface tension of mercury is  $475 \pm 4$  mN/m and remains fairly stable during the entire measurement period (1180 min). After the oxygen is introduced into the measuring cell and the beginning of exposure of the surface of mercury in oxygen, Hg is very rapidly reduced to 360 mN/m and then remains practically constant and equal to about 330 mN/m.

The paper gives possible explanations for the results obtained, as well as their discussion and comparison with the literature data.

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1. Kozin L.F and Hansen S.C. Mercury Handbook: Chemistry, Applications and Environmental Impact // Published by the Royal Society of Chemistry. 2013. S. 324