gaseous metal and the problem of the vapor-liquid (dielectric-metal) phase transition in metal vapors [[1]](#footnote-1)\*)

DOI: 10.34854/ICPAF.2020.47.1.100

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At compression and temperatures above critical, metal vapor plasma begins to exhibit a number of metallic properties. At first, it is the appearance of the electron jellium – the origin of the conduction band, as well as the emergence of the quantum, collective binding energy of atoms – cohesion. The jellium arises from the overlap of electron density tails of bound electrons lying outside the Wigner-Seitz cell. The emergence of jellium leads to the appearance of cohesion. These "metallic" properties are included in the "3+" model of plasma developed by the authors [1], which can be considered as a model of gaseous metal, the idea was first introduced by A.A. Likalter [2].

The main properties of gaseous metal are considered. The temperature-density phase diagram shows the region of the plasma's "gas-metallic" existence – the region where jellium electrons dominate thermally ionized electrons. The main features and properties of gaseous metal, for example, conductivity are discussed: the region of existence of gaseous metal near its binodal; conductivity behavior at supercritical isotherms – the presence of minimum and asymptotic. The physical meaning of the conductivity "asymptotic" with density increase is the conductivity of vapors along the vapor-liquid coexistence curve.

References

1. Khomkin A.L., Shumikhin A.S., JETP, 2017, **125**, 1189.
2. Likalter A.A., Sov. Phys. Usp., 1992, **35**, 591.

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/Lt/ru/EB-Shumikhin.docx) [↑](#footnote-ref-1)