

Alkali Plasmas: from equation of state to thermodynamics physical characteristics

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In the given report, we show the analytical equation of state for pure alkali metals (lithium, sodium, potassium, rubidium and cesium) in gas phase known also as alkali plasmas. The given equation has a simple form, generalizes the equation of state for a perfect gas and is universal for all alkali elements. It correctly reproduces the experimental data for the equilibrium gas phase over a wide range of pressures (up to $\sim 10\,000$ Pa) and temperatures (up to 3 000 K). On the basis of this equation of state, expressions for the thermal and caloric coefficients as well as for other physical characteristics are obtained. The results confirm feasibility of the principle of corresponding states in relation to the group of alkali elements [1].

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References

- [1] A.V. Mokshin, *Physics Letters A*, 2022, 424, 127819.