On estimating the critical temperature of the sodium–potassium eutectic

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The study of physico-chemical properties of liquid alkali metals and their alloys presents significant interest for the theory of liquid state and practical applications. In particular, the sodium–potassium eutectic (32 at % Na in K) is used as heat transfer media, as well as in many innovative applications [1].

In this work we present our estimate calculation of the critical temperature (T_c) of the eutectic alloy $Na_{0.32}K_{0.68}$, using the method we described in [2] and incorporating the most reliable experimental data on temperature dependency of the alloy [1, 3] approximated by linear equations. The results of our calculations of the critical temperature of the eutectic $Na_{0.32}K_{0.68}$ ($T_c = 2050$ K) are in good agreement with literature data [4]. We also demonstrate that experimental data on surface tension of the near-eutectic NaK allows at elevated temperatures is needed in order to further improve the accuracy of the calculations.

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