

MODELING OF PHASE EQUILIBRIA IN THE SrO-La₂O₃-Fe SYSTEM*Vorozhtcov V.A.⁽¹⁾, Stolyarova V.L.^(1,2), Almjashv V.I.^(1,3,4)*⁽¹⁾ Institute of Silicate Chemistry named after I.V. Grebenshchikov

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The Sr-La-Fe-O system is a promising base for multicomponent oxide materials that are essential for various applications, e.g., cathodes and electrolytes in solid oxide fuel cells, oxygen separation membranes, catalysts for high-temperature processes, and oxygen sensors [1, 2]. However, the development of new materials based on the Sr-La-Fe-O system is hindered by a lack of reliable information on the phase equilibria. This is the primary rationale for the present study, which deals with the calculation of the phase diagram of the SrO-La₂O₃-Fe and SrO-La₂O₃-Fe₂O₃ systems and comparison of the results obtained with the information available in the literature [2, 3].

Modeling of the phase equilibria in the Sr-La-Fe-O system was carried out using the NUCLEA database and GEMINI2 calculation software [4]. In the system under study, eight isothermal sections of the phase diagram were calculated, revealing how phase relations change with temperature and component contents. The equilibria were shown to involve only pure components and binary compounds. No ternary phases containing Sr, La, and Fe were observed. Two eutectic points were identified, establishing the maximum application temperature for materials in the SrO-La₂O₃-Fe system. The reasons for the discrepancies with the literature data [2, 3] were analyzed.

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