

Physico-Chemical nanomaterials science

Study of the subsolidus structure of the BaO – SrO – Al₂O₃ system

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SrO – BaO – Al₂O₃ – SiO₂ system draws attention of researchers from the side of the possibility to synthesis new heat resistant and radio transparent materials because of the simultaneous content of barium and slawsonite phases [1]. The information regarding full subsolidus structure for the SrO – BaO – Al₂O₃ – SiO₂ system is very limited. Analysis of the literature data showed that in this system information about subsolidus structure of the ternary system BaO – SrO – Al₂O₃ is limited without any triangulation data [2].

Thermodynamic analysis of the subsolidus structure of the studied ternary system was carried out by comparing of the Gibbs energy value changes in the temperature range 800 – 2000 K according to the methods, which is represented in the work [3].

In the theoretical studies was determined the subsolidus structure of BaO – SrO – Al₂O₃ which is a component of the SrO – BaO – Al₂O₃ – SiO₂ system, which was chosen as a basis for the celsian-slawsonite ceramic. The triangulation of the system have been done, the graph of the relation between elementary triangles have been built and the geometro-topological characteristics, eutectic composition and temperature have been calculated. Geometro-topological characteristics which belongs to the studies system have been presented. These data are useful for further studies of the subsolidus structure of the four-component SrO – BaO – Al₂O₃ – SiO₂ system.

1. Sintering aids for producing BaO·Al₂O₃·2SiO₂ and SrO·Al₂O₃·2SiO₂ ceramic materials [Text] : patent 5641440 The USA Int. Cl.6 C04B 33/34. / Talmy Inna G., James A. Zaykosk; the applicant and the patent owner The United States of America as represented by the Secretary of the Navy. – declared 26.07.1995; published 24.06.1997. – 5 p.

2. P. Appendino, *Rev. Int. Hautes Temp. Refract.*, **9** [3] 297-302 (1972).

3. Subsolidus structure of Al₂O₃-SiO₂-MgO-P₂O₅ system Pitak, Ya.N., Churilova, Yu.V. 2003 *Steklo i Keramika*