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Article 1

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Technological features of production of foamed glass used as the thermal insulation layer in a multilayer composite silicate heat insulating and decorative material

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Key words: silicate materials, foam glass, blowing agent, fly ash and slag waste, resource-saving

Abstract

The article is devoted to the technological features produce silicate foamed materials, investigation of the effect of different types of blowing agents (anthracite, chalk, glycerol) at the foaming ability of «ash and slag waste – glass cullet» compositions. The article includes photographs of the internal structure of produced prototypes of silicate foamed materials and test results of the research of their properties: density, compressive strength, thermal conductivity.

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Article 2

Makarov N. A., Vartanyan M. A., Yarovaya O. V., Nazarov E. E.

The study of wetting of silicon carbide by oxide melts

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Key words: silicon carbide, eutectic additive, surface tension, wetting angle

Abstract

The ability for wetting of the melts of several oxides CaO, MgO, SrO, Al₂O₃, Y₂O₃, Sc₂O₃, and Ln₂O₃ oxides of the group (for example, Er₂O₃), and oxide systems was analyzed towards silicon carbide. Equilibrium wetting angles at 1900 °C are calculated; the results prove that in such conditions the surface of SiC solid phase is sufficiently wetted by ternary eutectic melts of the mentioned oxides, i. e. CaO–Al₂O₃–Y₂O₃ и

MgO–Al₂O₃–Y₂O₃. This makes such eutectics candidate sintering aids in liquid-phase sintering of SiC-based ceramics.

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Article 3

Lebedeva Yu. E., Popovich N. V., Orlova L. A., Chaynikova A. S., Vaganova M. L., Kachaev A. A. Phase formation in the system Y₂O₃–Al₂O₃–SiO₂

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Key words: yttrium silicates, silicon carbide, phase formation, sol-gel method

Abstract

Processes of phase formation in the In the Y₂O₃–Al₂O₃–SiO₂ system are considered. A complex study of the gel and phase formation processes in yttrium-alumina-silicate system carried out. Evaluation behavior of the changes in the structure of the transient solution – gel – calcined gel – crystalline phase is determined.

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Article 4

Smoliy V. A., Yatsenko E. A., Gol'tsman B. M., Kosarev A. S.

The influence of ash on the temperature-time parameters of the synthesis of heat-insulating silicate material

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Key words: ash-slag waste, thermal insulating material, synthesis mode

Abstract

Possibility of using ash-slag waste in the production of thermal insulating glass materials was established. Compositions with different ash-slag content were developed, optimal compositions were identified. Influence of ash-slag waste on the temperature-time synthesis modes and structure of thermal insulating materials was established using DTA and XRD methods.

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