

NED UNIVERSITY JOURNAL OF RESEARCH

DEVELOPMENT OF COMPOSITION AND TECHNOLOGY OF CELLULAR GLASS USING VOLCANIC ASH

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Volume: XXII

No: 3

Pages: 177-190

Date: September 2025

<https://doi.org/10.35453/NEDJR-ASCN-2025-0017.R1>



Abstract:

The possibility of producing cellular glass using volcanic ash has been studied by considering the chemical and mineralogical composition of volcanic ash from the Molladag deposit. It was found that it contains aluminosilicates and is represented mainly by quartz, feldspar and amorphous phase. The optimal composition and the main technological parameters of thermal treatment of mixtures of volcanic ash (window glass production waste and volcanic ash) borosilicate frit together with a gas-forming agent were determined. To further optimise the experimentally observed composition and process regimes, an appropriate regression equation adequately describing the process was derived using the second order orthogonal rotatable plan available in the literature. A comparative X-ray phase analysis of the thermal processing products with the raw mixture was carried out and it is shown that the mineralogical composition of the cellular glass is represented mainly by the glass phase, feldspar and the newly formed mineral wollastonite.

Keywords: volcanic ash; cellular glass; thermal insulating material; amorphous phase; marble dust; sodium methylsilicate; borosilicate frit; wollastonite.

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