

Session	Poster Session
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Hall	TOPKAPI FOYER

## TECHNOLOGICAL AND PHYSICAL-CHEMICAL PROPERTIES OF BASALT FIBERS

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High mechanical strength, resistance to corrosion effect of aggressive media, good thermal resistance and relatively low cost of continuous basalt fibers predetermine wide scope of their application – primarily as a reinforcement material for various composites and also as the thermal insulation materials of the broadest designation. At the same time, instability of chemical composition of the basalts, presence of high-melting point crystalline phases like plagioclases with prevalence of the anorthite component, olivine and quartz cause chemical inhomogeneity of the melts. It has resulted in high melting temperatures of the rocks and high temperatures of fiber formation, and breakage of the fiber in zone of its formation. Modification of the composition of the continuous basalt fibers was performed in order to control their technological properties, at that, the basalt-chalk, basalt-dolomite and basalt-colemanite compositions were applied as raw materials. The compositions comprised fine crushed trap rock and 5–20 mass fractions of the modifying component. Use of the colemanite of ETIMADEN-Etiproducts Ltd in the compositions of raw materials seems optimal in terms of the effect exerted on the technological properties. Joint insertion of CaO and B<sub>2</sub>O<sub>3</sub> into the composition of the basalt glasses leads to significant decreasing of the viscosity and upper temperature of crystallization, and consequently – for decreasing of the fiber formation temperature by 50...80 °C. Reduction of viscosity and surface tension of the boron-containing basalt melt provides for chemical and structural homogeneity of basalt fibers. Influence of the aforementioned factors results in increasing of the mechanical strength of the modified basalt fibers obtained using the laboratory stand. In addition, the modified basalt fibers are characterized by high parameters of water and alkali resistance.

**Keywords:** *basalt, colemanite, continuous basalt glass fiber*