Session	Poster Session
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GLASS-CERAMIC MATERIALS FOR OBTAINING PROPPING AGENT

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Synthetic propping agents are produced by ceramic technology. In our study, we are demonstrating the possibility of obtaining propping agent in the glass-ceramic form. The glass-ceramic materials were obtained in two steps. On the first step, the glasses with composition R2O – MgO – CaO – Al2O3 – SiO2 (R2O – Na2O, K2O) were obtained with classic melt-quenching technique. Granite siftings with chemical composition, wt. %: SiO2 63.3; Al2O3 14.2; CaO 4.2; MgO 1.6; R2O 6.3; (Fe2O3+FeO) 5.4; TiO2 0.5; other 4.0 were used as an initial reactant. In addition, soda ash, chalk, and boric acid were added to the raw materials. Chromium oxide is used as the initiator of crystallization. The synthesis was performed at a maximum temperature of 1450 °C in the gas furnace for 2 h and the samples were annealed at 600 °C for 4 h in a muffle furnace. Glasses crystallizability has been evaluated by means of a complex method based on the results of gradient crystallization and differential scanning calorimetry data. The crystallization process is the most active in the temperature range of 800 -1000°C. The phase composition of the bulk crystallization products is represented by pyruxene solid solution of augite type (Ca, Mg, Fe2+) (Mg, Fe2+, Al, Fe3+) [(Si, Al)2O6] and nepheline Na[AlSiO4]. On the next step, glass microspheres were obtained using the method of melt dispersion and were heat-treated at 830–860°C for 10–30 minutes for crystallization. Obtained glass-ceramic granules have high sphericity and roundness with dense structure and are characterized by the absence of pores, reducing its operational characteristics. The bulk density of proppants was 1680 kg/m3, solubility in 15% hydrochloric acid is 0.7%, in a mixture of hydrofluoric and hydrochloric acids is 2.0%.

Keywords: *glass, glass ceramics, propping agent*