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INFLUENCE OF ULTRASONIC TREATMENT OF CHARGE ON THE DEVELOPMENT OF TECHNOLOGICAL COMBUSTION SYSTEM OF QUARTZ-CALCIUM

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Abstract. This paper considers the optimal conditions of ultrasonic processing of raw materials. The starting material is processed to produce a technological mode of combustion (SH-synthesis) of high-quality composite. In this paper conducted research on the SH-synthesis of ceramics.UST is set to ensure receipt of raw material (quartz, calcite) in a highly active state, which allow purposefully regulate Ultrasonication treatment (UST) quartz and calcite conducted in an aqueous medium. Modifying additives in UST calcite and quartz were butanol - C_4H_9OH, glycerol (trihydric alcohol - $C_3H_5(OH)_3$) and urea-CO $(NH_2)_2$. Thermokinetic characteristics of the combustion process. UST conducted for 10, 20 and 40 minutes at a weight ratio of powder to water volume of 1/10. It was revealed that after sonication quartz synthesis products Al_3O_4 phase content increases and particularly when the UST in the aqueous medium containing glycerol. It is shown that after the UST quartz calcite for 40 minutes in a 10% aqueous solution of butanol using it SHS charge leads to substantially complete combustion reactions implementation quartz and significant use of aluminum. In the process of synthesis of ternary compounds are formed: gehlenite - $Ca_2Al((AlSi)O_7)$; grassi - $CaAl_4O_7$. Combustion products studied system after processing the mixture of quartz and calcite in an aqueous solution of 10% urea and paravollastonit appears to 6% - $Al_{2.144}O_{3.2}$. Use of organic additives, modifiers UST shown in their impact on the efficiency in the process of formation of the synthesis of various compounds based on silicon and calcium. The results of studies on the UST quartz and calcite minerals showed the effectiveness of such treatment of the raw material for subsequent use in preparing the composite material through the combustion process. The important fact is individual selection of the most effective modes of UST for the raw materials used.

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ВЛИЯНИЕ УЛЬТРАЗВУКОВОЙ ОБРАБОТКИ ШИХТЫ НА РАЗВИТИЕ ТЕХНОЛОГИЧЕСКОГО ГОРЕНИЯ СИСТЕМЫ КВАРЦ-КАЛЬЦИТ

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Ключевые слова: Механохимическая обработка, ультразвуковая обработка, СВ-синтез, кварц, кальцит, технологическое горение, композит

Аннотация. В работе рассматривается оптимальные условия ультразвуковой обработки сырья. Исходный материал обрабатывается для получения в режиме технологического горения (СВ-синтез) высококачественного композита. В настоящей работе проводились исследования по СВ-синтезу керамики. Установлены режимы УЗО, обеспечивающие получение сырьевого материала (кварц, кальцит) в высокоактивном состоянии, которые позволяют целенаправленно регулировать термокинетические характеристики процесса