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**Time-resolved X-ray Diffraction during  
Combustion in the Ti–C–B System**

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**ABSTRACT**

The method of time-resolved X-ray diffraction was analyzed in order to apply it to the diagnostics of the combustion processes of SHS systems. This method allows in-situ sequential registration of X-ray patterns of burning samples. Analysis and interpretation of “the diffraction cinema” provided data on the reactivity, the kinetics and the mechanisms of solid-phase reactions. The method was found to be efficient for the diagnostics of phase transformations occurring in the combustion wave, and in the heating and under-burning zones. The results obtained by the proposed method in the three-component system of Ti–C–B were reported. The stages of the phase-forming processes were determined.