EXPERIMENTAL STUDY OF THERMALLY COUPLED SELF-PROPAGATING HIGH-TEMPERATURE SYNTHESIS PROCESSES IN THE LAYERED SYSTEM Fe_2O_3 + 2Al/Ti + Al

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Abstract: Experimental diagnostics of coupled self-propagating high-temperature synthesis (SHS) processes was carried out using the example of the Fe_2O_3–Al systems (highly-exothermic system, donor) and Ti–Al (low-exothermic system, acceptor). The samples were a three-layer composition "donor–acceptor–donor." Temperatures were measured in the donor and acceptor layers during SHS as well as at their interface. The process of burning the samples was videotaped. The obtained data made it possible to draw a conclusion about the mode of occurrence of thermally coupled processes. Phase analysis of the combustion products of the target system Ti–Al was conducted.

Keywords: combustion; self-propagating high-temperature synthesis; thermally coupled systems

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