EFFECT OF IRON AND BORON POWDERS ON COMBUSTION OF HETEROGENEOUS CONDENSED SYSTEMS

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Abstract: The influence of ultrafine powders (UFPs) of iron and amorphous boron on the burning rate and composition of condensed combustion products (CCPs) of heterogeneous condensed systems (HCSs) on the basis of ammonium perchlorate (AP) and butadiene rubber SKDM-80, containing 15.7 %(wt.) of UFP aluminum Alex, was studied. It was found that partial replacement of Alex by 2 %(wt.) UFP iron in the composition of HCS leads to the increase of the burning rate by 24% and reduction of the relative masses of CCPs particles by 28% at nitrogen pressure 3.9 MPa in the constant pressure bomb. At partial replacement of UFP Alex by amorphous boron powder, the burning rate of HCS does not change, the relative mass of CCPs increases by 8%, the average diameter of CCP particles d_{43} reduces from 37.4 (Alex) to 33.5 (Alex + Fe) and 32.6 μm (Alex + B), and the content of aluminum oxide α-Al_2O_3 and carbon nitride C_3N_4 increases.

Keywords: heterogeneous condensed system; powders of aluminum, iron, boron; condensed combustion products

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