

Characteristics of electric spark initiation of a chemical reaction in a mixture of aluminum and copper oxide powders

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The subject of this report is an experimental study of the effect of the geometry and energy of a microsecond spark discharge on the ignition intensity of a stoichiometric mixture of aluminum and copper oxide powders. The parameters of the electric current pulse through the spark characterized the discharge energy. The geometry of the electrodes determined the initial conditions for the formation of a spark discharge. The geometry of the electrodes, the parameters of the current pulse, the electrical properties of the components and the porosity of the mixture formed the volume of discharge energy release. The rate of formation of the volume of burning products in free space characterized the intensity of ignition. The plasma pressure value in a microsecond electric discharge of 50 MPa characterizes the guaranteed initiation and propagation of a chemical reaction in a mixture of aluminum and copper oxide powders.