

Abstract Submitted
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Driving Ability of HMX based Aluminized Explosive Affected by the Reaction Degree of Aluminum Powder YINGLIANG DUAN, CAEP —

Due to the time scale of aluminum reaction, the detonation process of the aluminized explosive becomes very complex, and there is less agreement on the reaction mechanism of aluminum powder. If the reaction of aluminum occurs in the reaction zone, the energy released will further strengthen the work ability of detonation wave. So it is very important for characterizing the detonation parameters and detonation driving ability to accurately understand the role of aluminum powder in the reaction zone. In this paper, detonation driving process of HMX based aluminized explosive was studied by cylinder test, obtaining the expansion track of cylinder wall. In order to further research the reaction degree (λ) of aluminum in the reaction zone, the thermodynamic program VHL was used to calculate the detonation process at different reaction degrees, obtaining the parameters of detonation products thermodynamic state. Using the dynamic software LS-DYNA and the JWL equation of state by fitting the pressure and relative volume relationship, the cylinder test was simulated. Compared with the experimental results, when the reaction degree is 20%, the driving ability is found to be in agreement with measured ones. It is concluded that the driving ability of HMX based aluminized explosive can be more accurately characterized by considering the reaction degree of aluminum powder in the reaction zone.

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