Influence Rule of Quasi-isentropic Loading Characteristics on the Initiation of PBXC03 Explosive

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Abstract：To investigate the influence rule of quasi-isentropic loading characteristics on the initiation response characteristics of polymer bonded explosive（PBX），the initiation response process of PBXC03 explosive under quasi-isentropic loadings with different loading pressures（8，10，12 GPa）and loading slopes was numerically simulated. The parameters of an elastic/viscoplastic double hollow spherical-shell collapse reaction rate model（DZK）of PBXC03 explosive were determined by backside particle-velocity history curves at 1，1.5，2，3 mm and 4 mm obtained from the initiation response experiment of PBXC03 explosive under the quasi-isentropic loading. The influence rule of peak pressures and loading slope on the initiation response characteristics of PBXC03 explosive under quasi-isentropic loadings was obtained by the DZK model and the parameters. The results show that the two loading methods（different pressures and loading slopes）have a great influence on the initiation process of PBXC03 explosive. Under other conditions being equal，the higher the loading slope or peak pressure is，the faster the growth of peak pressure curve and the shock wave trace of shock wave front in the explosive，and the shorter the time-detonation is.

Key words：polymer bonded explosives（PBX）；quasi-isentropic loading；explosive initiation response rule；DZK model.

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