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Low Velocity Detonation of Nitromethane Affected by Precursor Shock Waves Propagating in Various Container Materials HIDEKI HAMASHIMA, Shock Wave and Condensed Matter Research Center, Kumamoto University, AKINORI OSADA, Department of Mechanical System Engineering, Kumamoto University, YUKIO KATO, R&D division, Nippon Koki Co., Ltd., SHIGERU ITOH, Shock Wave and Condensed Matter Research Center, Kumamoto University — It is well known that some liquid explosives have two detonation behaviors, high velocity detonation (HVD) or low velocity detonation (LVD) can propagate. A physical model to describe the propagation mechanism of LVD in liquid explosives was proposed that LVD is not a self-reactive detonation, but rather a supported-reactive detonation from the cavitation field generated by precursor shock waves. However, the detailed structure of LVD in liquid explosives has not yet been clarified. In this study, high-speed photography was used to investigate the effects of the precursor shock waves propagating in various container materials for LVD in nitromethane (NM). Stable LVD was not observed in all containers, although transient LVD was observed. A very complicated structure of LVD was observed: the interaction of multiple precursor shock waves, multiple oblique shock waves, and the cavitation field.

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