

Abstract Submitted
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Rice-Walsh equation of state for detonation product gases KUNIHITO NAGAYAMA¹, Retired, SHIRO KUBOTA, National Institute of Advanced Industrial Science and Technology — We have established a differential equation for the non-dimensional material parameter, the Wu-Jing parameter R introduced into the Rice-Walsh type equation of state (EOS) for detonation product gases of condensed phase high-explosive. This analysis is based on the empirical linear relationship between detonation velocity and loading density together with the assumption that the Wu-Jing parameter is a function of pressure alone. We obtained the Wu-Jing parameter along C-J states of arbitrary initial loading density of high explosives. It is found that behavior of this parameter R as a function of pressure is revealed to change very gradually with pressure. Calculated C-J states as a function of initial density, including parameters such as adiabatic index at each C-J states coincides with our previous similar calculation assuming the Grüneisen type EOS. In conclusion, the Rice-Walsh EOS with the Wu-Jing parameter as a function of pressure as well as the Grüneisen EOS with the Grüneisen parameter as a function of volume are not compatible with each other, but both are compatible with detonation velocity data for various initial densities.

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