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Study of Detonation and Cylinder Velocities for Aluminized Explosives LEONARD STIEL, Polytechnic University, ERNEST BAKER, CHRISTOS CAPELLOS, U.S.ARMY TACOM-ARDEC — The detonation properties of aluminized explosives have been studied using experimental data available in the literature and EXP-6 thermo-chemical potential calculations with the JAGUAR computer program. It has been found that the observed detonation velocity behavior for aluminized explosives can be accurately represented by a reaction zone model in which unreacted aluminum is initially in equilibrium with H-C-N-O compounds. The JAGUAR procedures have been modified to represent the aluminum reaction zone behavior and to enable specified temperature differences between the gas and aluminum particles in the initial portion of this reaction zone. The modified procedures enable isentropic expansion for incomplete or complete aluminum reaction in the zone, and result in close agreement with experimental cylinder test data for several explosives. In order to aid in the application of the model, constants of thermodynamic equations of state are related to the extent of aluminum reaction.

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