New Method and Mathematic Model For Formulation Design of Multi-component Composite Explosives

Jianjun Tang, Wenjuan Bai
The Industrial Explosive Research Department
Changsha Institute of Mining Research, China

ABSTRACT: This paper presents a new method of formulation design for multi-component composite explosives. Based on the thermochemistry of the detonation process, the mathematic model of formulation design is established by optimization mathematics. Using the heat of detonation as target functions and taking the constraint conditions such as oxygen balance and costs etc into consideration, this model can provide an optimal solution quickly by means of personal computer. Using this method, the calculation and the simulation tests for a series of constituent sets and various constraint conditions can be conducted easily. In this way, the optimal formulation for the explosive can be determined, on the basis of the maximum heat of detonation and the lower cost.

Key Words Composite explosives Industrial explosives Formulation design Formulation calculation Mathematic model Optimization