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EXPLORATORY DEVELOPMENT OF GREEN PROPELLANTS

Abstract

With the development of large solid rocket boosters for the space launches,the influence of hydrogen chloride in the exhaust during working of the boosters on the atmospheric environment is future aggravated and so much as the regional acid rain would be formed.So that,the experimental investigation on the adding potassium nitrate or ammonium nitrate as a part of substitute of ammonium perchlorate in the AP/HTPB propellants was carried out to decrease the hydrogen chloride content in the exhaust of ammonium perchlorate based composite propellants.The research preliminary exposed the mechanical properties and the burning behavior of the propellants,and on that basis,the manufacture of the propellant grains of the standard motor with 165 mm diameter and their static firing tests were completed.In the firings,the motors worked normally and the hydrogen chloride content in the exhaust of the motors decreased obviously,but the specific impulse of the propellants was on the low side.This paper suggests to conduct the development of increasing the energetic performance of the green propellants to meet the energy requirement of propellants for the large solid boosters.