Paper ID: 28021
poster

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Interactive Presentations (IP)

Author: Mr. Jian-qiang Tu
China Academy of Aerospace Aerodynamics (CAAA), China

Mr. lian-zhong chen
China Academy of Aerospace Aerodynamics (CAAA), China
Mr. hai-qun chen
China Academy of Aerospace Aerodynamics (CAAA), China
Mr. you-hua zhang
China Academy of Aerospace Aerodynamics (CAAA), China

EXPERIMENTAL INVESTIGATION ON THE DECOMPOSITION RATE OF PHENOLIC RESIN THERMAL PROTECTION MATERIAL

Abstract

Phenolic resin composite has been widely used as a thermal protection material of aircraft and commercial industry product. The thermal protection mechanism is that the phenolic resin composite decomposes at high temperature to forms the carbonization layer, and at last the carbonization layer has been ablated to form the ablation layer. The thickness of the carbonization layer or the decomposition rate is the important parameter to evaluate the thermal protection performance. In order to find out the carbonization course within the composite material, the decomposition rate has been investigated on the assumption that the decomposition phenomenon happens in the same temperature. Four kinds of phenolic resin composites with different prescriptions and the method of radiation heating with quartz lamps are adopted. The thermocouples are used to measure the inner temperatures, which are in the different thicknesses of the materials. The decomposition rates are calculated according to the inner temperatures and the decomposition rate expressions. So the curves between decomposition rate and the thickness can be gotten out. It elementarily reflects the decomposition course within the phenolic resin composite.