

Further Studies of Materials Compatibility in High-Test Hydrogen Peroxide

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Assessment of the compatibility of high-test hydrogen peroxide (HTP) with materials, in particular new materials such as composites, is critical to the development of new propulsion systems meeting requirements of reduced cost and environmental impact. While compatibility with HTP has been addressed previously, newer materials were not considered. The focus of this project was to develop a scheme for evaluation of HTP with all materials. In the previous summer, methods were developed for production of HTP on site, and preliminary steps were taken to evaluate materials. Methods investigated this summer have included accelerated aging by heating, coupled with assay of concentration and stabilization loss, observation of reactivity by means of Isothermal Microcalorimetry, and evaluation of changes to the materials by Short Beam Shear testing and by Photoacoustic-Fourier Transform Infrared Spectroscopy. Various metals, polymers, and composites were examined in this study.