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NASA TECH BRIEF



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Study of Hydrogen Slush-Hydrogen Gel Utilization

The study of hydrogen slush-hydrogen gel utilization constitutes the first formal investigation of subcooled liquid and slush hydrogen fuels for space vehicle applications. Results of this study program are reported in two volumes. The first volume contains the physical and thermal property data for hydrogen used in the study plus complete property data from the triple point to the critical point. In the second volume, details of the technical effort are presented including parametric analysis of effects on vehicle systems and applications of subcooled hydrogen to three study vehicles.

Because it was determined that insufficient data were available on hydrogen gels, it was decided to concentrate the study effort on triple-point hydrogen. In phase 1, all available property data on subcooled (including slush) and gelled hydrogen were compiled for later use in phases 2 and 3. In phase 2, effects of using triple-point hydrogen were investigated on vehicle subsystem designs in parametric fashion. These effects were then evaluated for each of the affected vehicle subsystems prior to the phase 3 vehicle application studies.

In conducting phase 1 it was found that all of the fundamental physical and thermal properties of hydrogen needed to properly perform phases 2 and 3 were available in the literature. It was further found that additional data in the form of triple-point hydrogen flow characteristics will be required to conduct detail design of flight subsystems.

Note:

A complete report of the findings of this study is contained in Lockheed Missiles and Space Company report K-11-67-1, volumes I and II, available from:
Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10413

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: C. W. Keller
of Lockheed Missiles and Space Company
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Category 02



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Development of a High-Speed, Low-Cost, and Reliable Data Acquisition System

The development of a high-speed, low-cost, and reliable data acquisition system is a major objective of the NASA Technical Information Administration (NTIS). This system is designed to meet the needs of a wide range of users, from small businesses to large corporations. The system is based on a microprocessor-based architecture and is capable of handling large amounts of data at high speeds. It is also designed to be easy to use and maintain, and to provide a high level of reliability. The system is currently being tested and evaluated, and is expected to be available to the public in the near future.

The system is designed to be a modular system, allowing users to add or remove components as needed. It is also designed to be compatible with a wide range of hardware and software configurations. The system is currently being tested and evaluated, and is expected to be available to the public in the near future.