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N. A. Olien
S. A. Schiffmacher

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HYDROGEN-FUTURE FUEL - A BIBLIOGRAPHY
(WITH EMPHASIS ON CRYOGENIC TECHNOLOGY)

N. A. Olien and S. A. Schiffmacher

This NBS Technical Note is a compilation of references dealing directly and indirectly with the possible future use of hydrogen as a fuel. The references were selected using an automated information system operated by the Cryogenic Data Center. This bibliography of references emphasizes the use of cryogenic technology in the hydrogen field. Articles are indexed under 40 subject headings and an author index is included. Over 1600 references are included in this bibliography.

Key words: Cryogenic technology; data; energy; fuel; hydrogen; hydrogen properties; LNG/SNG; production; safety; storage

INTRODUCTION

The Cryogenic Data Center was established in 1958 to assist the staff of the Cryogenics Division, other organizations within the National Bureau of Standards, other government agencies and private industry, in keeping up with the flood of information in this multi-disciplinary field.[1,2] The field of cryogenics is, after all, defined by a temperature range rather than by subject or discipline. As time has gone on it has been necessary to reassess, on several occasions, the breadth of information being entered into the Cryogenic Data Center's Information System. This has been necessary because cryogenics is a growing field and with a relatively constant staff it has

not been possible to keep up with the corresponding growth in the literature. Decisions regarding which areas can be covered to less depth and those requiring expansion of our efforts have always been made in concert with the staff of the NBS-Cryogenics Division and other technical people in the cryogenics industry. The last major redirection took place in early 1973. The result was a net change of about 25 percent in our coverage of the current literature in order to adequately cover the field encompassed by the present bibliography. We also began publishing a quarterly titled Hydrogen-Future Fuel which is issued each August, November, February and May.[3] The quarterly and this publication utilize the Data Center's Information System as the source of the references contained in each. These efforts within the Cryogenic Data Center were done in concert with a much larger effort in other sections of the NBS-Cryogenics Division. These efforts were concerned with production, storage, applications, materials compatibility, metrology, transmission and other systems involving cryogenic hydrogen. The results of these efforts will be summarized in a National Bureau of Standards Special Publication to be published in 1975.

One other effort of the Cryogenics Division bearing on the subject of cryogenic hydrogen should be mentioned at this point. Since late 1972 the Cryogenic Data Center has been locating, cataloging,

and abstracting all available documents dealing directly and indirectly with hydrogen safety. This work has been sponsored by the National Aeronautics and Space Administration's Aerospace Safety Research and Data Institute (ASRDI) at the Lewis Research Center, Cleveland, Ohio. The aim has been to supply input information for a large on-line information bank which will serve as a national resource with regard to aerospace safety. We have also been engaged in preparing, during the past year, a hydrogen properties handbook, which will bring together in one publication all available data on hydrogen properties as well as giving recommended values. This document is in editorial review and will be published as a NASA Special Publication similar to one we prepared on oxygen a few years ago.[4]

We have tried to make the present publication as complete as possible, but we would appreciate additional references from any of our readers who may see an omission. As the title states, this publication emphasizes cryogenic hydrogen and as such is meant to complement rather than duplicate the bibliography edited by Cox.[5]

We plan to keep this bibliography current by means of future issues of Hydrogen-Future Fuel, the quarterly mentioned above. Comments or additions should be sent to the attention of the first author at:

Cryogenic Data Center
Institute for Basic Standards
National Bureau of Standards
Boulder, Colorado 80302

The bibliography lists the references under 40 subject headings. A given reference can be listed under more than one heading. The subject headings correspond with those used in the previously mentioned quarterly and will correspond to those of future issues of the same publication. A complete author index is also included.

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