

## A BOOK REVIEW

Wasserstoff als Energieträger  
Technik – Systeme – Wirtschaft  
ISBN 978-3-540-50221-0  
Editors C.-J. Winter and J. Nitsch  
Springer-Verlag original publication 1989.  
384 pages with 197 figures and 71 tables, b&w.

Today, as the world witnesses a third oil-crisis and the price of oil reaches new maxima, alternative energy carriers gain new vigour.

Hydrogen has this special role among alternative energy carriers to have been known for a long time, ever since its respective discovery and name-giving by Dalton and Lavoisier now over two centuries ago. Nevertheless, this lightest of elements has proven to be a huge challenge to engineer properly – not least when competing with the almost elementary hydrocarbons which humankind burns all over the world. The general conception that this burning is currently creating a need for a paradigm shift in energy technology is one of the most important challenges facing the world.

Amongst the numerous books published about hydrogen energy technology there is a gem originally published in 1989 but with such fundamentally powerful message and clarity that it has become a classic in its field. When the book was written Winter was the director of the German Aerospace Centre's Stuttgart department, and all the names in the book were his staff. The book is therefore quite a collaborative effort.

The introductory text by Winter opens the book and maps out the structure of the energy system in a typical industrial country with or without the import of fossil fuel. The chapter serves as an excellent introduction to what is to come: a cavalcade of chapters written by experts on aspects ranging from hydrogen as raw material, to its safety aspects, to various pathways of production from non-fossil primary energy. The important thermodynamics of solar-thermal energy use for hydrogen production is addressed by J. Nitsch and the experience gained in experiments with the splitting of water is described in detail. This is a part B of the book dedicated to non-fossil origins of hydrogen.

A chapter on selected systems for the production of hydrogen provides an interesting insight into the technology. This chapter is written by Schurnberger, Seeger and Steeb, and provides an excellent overview for the modern reader although it does not elaborate on the technology of biological hydrogen which in fact gained attention by the research community after the publication of this book. The same applies to photoelectrochemical methods developed since the publication of the book as well as advances in chemical storage of hydrogen in metal hydrides and related systems where a lot of progress has been made in the past two decades.

The challenges of storing hydrogen are treated by C. Carpetis in a special chapter where the approach is clear and the presentation done in an easily understandable form. In a section marked C, the book turns its attention to the world market of hydrogen in a number of chapters written by J. Nitsch et al. By reading this part of the book the reader quickly gains insight into the state of affairs for hydrogen some two decades ago. At that

point the main emphasis in Germany was on the prospects of solar-hydrogen, an area which still today is ever more promising.

The reader is assisted in many ways as the book is used. A variety of figures and tables helps to further understanding of the subject. I would have liked to see a more thorough index at the end, on the other hand the references at the end of each chapter are very detailed and far reaching.

In summary, this book is a treasure chamber for anyone interested in the application of the lightest of elements to energy on Earth. I have myself had it at my bedside for years and this is perhaps as it serves best: a companion for anyone interested in hydrogen – or like in my case, a crucial reference to the work that has been done with hydrogen.

For the English speaking reader the book is also available in the English language, translated in those days by Peter Hoffmann and his wife Sarah.

The question about how time has affected this book leaves the reader with the feeling that the book, even today, two decades after its publication, is a time-less classic. I recommend all newcomers to the field to read this book and use it as a part of their information source.

Thorsteinn I. Sigfusson  
Professor and General Director  
Laureate of the Global Energy Prize.