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Book review

Hydrogen and other alternative fuels for air and ground transportation, edited by H. W. Pohl. John Wiley & Sons, 1995. xv + 206 pages.

The book under review is a compact compilation of the proceedings of a workshop held by the European Commission at Brussels (Belgium), in June 1993, to discuss the rationale and the possibilities for alternative fuels in air—and ground—transportation, and to identify the actions to be undertaken. These discussions are covered in 12 chapters, written by representative research leaders from the U.K., France, Germany and Russia.

The two crucial problems associated with petroleum fuels currently used in transportation systems, namely, resource-depletion and environmental damage, are clearly analysed in the first two chapters. It is argued, quite convincingly, that of the two problem-factors mentioned, atmospheric pollution, particularly the irreversible CO_2-build-up, provides a stronger impulse for switching over to alternative 'clean' fuels within the next two or three decades, lest the CO_2-situation should go out of control.

Then follows a survey of renewable energy-sources and energy-carriers. The choice of a viable alternative to petrofuels falls logically on natural gas and hydrogen—the former for the near-term and the latter as the permanent long-term solution.

The rest of the book focuses on hydrogen and the implications of its use as a transportation fuel, particularly in aviation. For use in aircraft, hydrogen has to be carried only in liquid form (LH_2). The technologies for the large-scale production of hydrogen and the technical intricacies of LH_2 storage and transmission in the aircraft are discussed from both the technical and the economic perspectives, in the next six chapters. An innovative process for CO_2-free production of hydrogen from natural gas by catalytic pyrolysis, the infrastructural requirements on ground for the supply and distribution of LH_2 at airports, the experiences gained from the use of LH_2 in spacecraft and in experimental test-flights of LH_2-fueled commercial passenger airplanes, aeroengine modifications for hydrogen fuel and, most importantly, the safety aspects of handling hydrogen in typical airport situations, are some of the highlights of these chapters.

On the use of hydrogen as an automobile fuel, which had generated so much interest among the public over the past two decades, there is just one chapter by Buchner of Daimler–Benz covering, mainly, the developmental experiences of two German automobile giants, Daimler–Benz and BMW. Some details are given of D–B's successful trial operations of hydrogen-powered cars and trucks in the city of Berlin.

Finally, as an outstanding example of international cooperation in a comprehensive demonstration project aimed at the development of the hydrogen energy vector, details of the on-going 100 MW(e) Euro–Quebec Hydro Hydrogen Pilot Project are given in the last chapter.

In conclusion, the book presents a perspective view of the concerns relating to transportation fuels and the technological inputs needed for switching over to alternative clean fuels.

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