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HYDROGEN IN ELECTRIC AND TRANSPORT POWER ENGINEERING

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Author
Karp I.M.
The Gas Institute of NAS of Ukraine,
39 Degtyarivska Str., 03113, Kyiv, Ukraine,
e-mail: karpkiev@gmail.com

Abstract

It is shown that more energy is consumed in hydrogen production than can be obtained from its use. We are talking about the production of green hydrogen. The production of 1 m3 of hydrogen consumes 4 to 5 kWh of electricity, although it contains 2.9 kWh of chemical energy. The calorific value of hydrogen is 3.3 times less than that of methane. Hydrogen as a substance is characterized by a high penetration capacity, its transportation in ordinary pipes causes their corrosion and embrittlement. The implementation of this process requires the use of special materials for pipelines, as well as special design, compressors, sensors. Hydrogen has wide explosive limits, high torch propagation rate, and its use is associated with the application of special safety measures. The use of hydrogen as a fuel to drive the gas maneuvering capacity in the grid or to replace liquid motor fuels requires generating capacity for its production commensurate with the installed capacity of the entire Ukrainian grid, significant volumes of water and solving the problem of using excess oxygen. The energy costs of producing hydrogen for fuel cells are quite significant, so converting it back to electricity is clearly inappropriate. Thus, given the cost of electricity from renewable sources and the economy of hydrogen production, its continued use is disadvantageous. A similar conclusion can be drawn regarding the transport of hydrogen in the compressed or liquefied state. The driver of hydrogen energy is the desire to prevent anthropogenic impacts on climate change. The large number of hydrogen energy projects that are being launched today in Europe and in the world can be explained by the considerable funds allocated to research this problem. Powerful companies and scientists -

hydrogen acts - are interested in implementing such projects. References 9, figure 1.

Key words: hydrogen, production, transportation, storage, efficiency.

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