

HYDROGEN LIQUEFACTION AND LIQUID HYDROGEN STORAGE

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ABSTRACT

An important pathway for the establishment of hydrogen as alternative, clean energy carrier is the storage, transport and allocation as low-temperature fluid in liquid state. This is seen mandatory e.g. for all kind of hydrogen-based “clean” aviation. The latter is presently pursued with great emphasis.

However, the liquefaction of hydrogen at a temperature of approx. 20 K (-153 °C) is a demanding and energy-intensive process. A sophisticated technology is needed for further transfer and storage. The present contribution addresses the thermodynamic background, processes and technology applied in today’s hydrogen liquefiers, with a special focus on overall efficiency. Liquefier of different capacities are compared. Handling and technological challenges plus solutions for transfer and storage are shown. Existing realizations and future applications are highlighted.