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C1Po1A-10: Hydrogen permeability of fiber-reinforced thermoplastics under cryogenic conditions

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Developments toward future liquid hydrogen mobility require lightweight cryogenic engineering, favoring the use of composite materials over stainless steel. Fiber-reinforced thermoplastic (FRT) composites are considered for cryogenic applications, such as tanks and transfer systems. However, the permeation of hydrogen molecules through composite materials represents a significant challenge, as even small amounts can critically impair the insulation vacuum. Therefore, it is essential to evaluate the hydrogen permeability of these FRTs. This contribution presents a concept for measuring the long-term permeability rate of an FRT pipe section exposed to either liquid hydrogen or cryogenic gaseous hydrogen.

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