A Hydrogen-Generating Plant for Submarine Fuel-Cell Use Based on Methanol Decomposition

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ABSTRACT

A design study of a hydrogen-generating plant based on the decomposition of methanol and intended as a source of hydrogen for fuel cells to be used in submarine propulsion is reported. The plant is designed to supply 20 pounds per hour of ultrapure hydrogen normally (70 pounds per hour maximum) and is optimized on the basis of minimum volume and weight, minimum oxygen consumption, maximum efficiency, maximum simplicity and reliability, minimum hazard, minimum maintenance, and minimum cost. For ten days of continuous operation at normal capacity, the hydrogen-generating equipment and fuels (methanol and oxygen for combustion) represent a combined specific weight of about 1.0 lb./kwh and a specific volume of 0.018 cu. ft./kwh.