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C2Po1H-02 [44]: Dynamic simulation of a medium-sized hydrogen liquefier based on EcosimPro simulation software

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A dynamic simulation of a medium-sized hydrogen liquefier has been proposed using process simulation software EcosimPro. A helium refrigerator with one turbine provides cooling power for this hydrogen liquefier. A dynamic simulation model based on Ecosimpro has been established according to the designed process flow. The pressure ratio of the helium compressor is 2/16 bar. The helium mass flow rate is 111 g/s. The hydrogen mass flow rate is 4.3 g/s. The liquefaction ratio of hydrogen is about 191 L/h. A control logic and control strategy for this hydrogen liquefier has been designed. The cooling down curves of the helium circuit and hydrogen circuit has been proposed. The trend of liquid level of hydrogen dewar is also simulated. Moreover, one hydrogen liquefier process flow which uses two helium turbines to provide cooling power has been also proposed.

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