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C2Po2B-04: The design and development of the cryogenic compressed gas refueling system

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As a new economical, efficient and feasible high density hydrogen storage method, cryogenic compressed hydrogen has been widely concerned by scholars in recent years. Based on the existing hydrogenation stations at normal temperature and high pressure, this paper proposes a new cryogenic compressed hydrogen refueling process based on liquid nitrogen precooling, which can generate 80K and 35MPa hydrogen, and at the same time this can reduce the loss of hydrogen under the random initial state conditions of the cryogenic compressed hydrogen tank. The main operating modes of the system include compressor cycle, hydrogen cycle precooling, refueling and standby. In order to verify the feasibility of key equipment and the above process, helium gas is used as the working medium to build the above system process. The fabrication of the cold box, compressor and cryogenic tank have been completed. The commissioning of the system is foreseen in the near future.

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