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Helium Recovery from Rocket Test Systems

This Hawai?i Natural Energy Institute (HNEI) project is being funded by Sierra Lobo, Inc. via a grant from the National Aeronautic and Space Administration (NASA). Gaseous helium (GHe) is the only suitable purge gas for use in rocket test programs, and is a scarce product. During test operations, the GHe often becomes contaminated with gaseous hydrogen (GH_2). The GH_2 must be separated out before the GHe can be reused for testing, so a separation process is required. The method currently used involves cryogenic distillation. The project objective is to develop a new separation system that is more efficient and less costly than cryogenic distillation.

HNEI tests and operates various proton exchange membrane fuel cell systems (PEMFCSs) in its Hawai?i Sustainable Energy Research Facility (HiSERF). Under this project, HNEI is studying the feasibility of using a PEMFCS at its HiSERF to do the GHe/GH_2 separation. The goal is to yield a separated stream of gas that has > 99.995% pure GHe. Research work has included testing of a laboratory-scale FEMFCS, modeling for an expanded pilot-scale system, and planning for optimization for the pilot-scale system. For details on this project, see the Helium Recovery from Rocket Test Systems [1] pdf document.

The primary contact for this project is Michael Angelo [2]. For general information about fuel cell research activities, contact Rick Rocheleau [3] and see the Fuel Cells [4] section of our website. For specifics about the HFCTF and fuel cell testing activities, see the Fuel Cell Testing [5] section.

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Source URL: http://www.hnei.hawaii.edu/projects/helium-recovery-rocket-test-systems

Links:
[1] http://www.hnei.hawaii.edu/sites/web41.its.hawaii.edu.www.hnei.hawaii.edu/files/page/2012/06/131202%20Helium%20Rec
[2] http://www.hnei.hawaii.edu/staff/michael-s-angelo
[3] http://www.hnei.hawaii.edu/staff/richard-e-rocheleau
[4] http://www.hnei.hawaii.edu/research/fuel-cells
[5] http://www.hnei.hawaii.edu/research/fuel-cells/fuel-cell-testing