

Recovery of Energy from Pressurized Hydrogen using Ionic Liquids

Relevance to the Automotive Industry:	If hydrogen is to be used as a fuel either in cars equipped with fuel cells or with internal combustion machines, hydrogen has to be stored on board either as liquid hydrogen at very low temperature or as gaseous hydrogen at very high pressure. Recovering the energy from the pressurized hydrogen will enhance the overall efficiency.	
Research Location:	TUD Thermal Process Engineering	VT
Homepage (Engl.):	http://www.tu-darmstadt.de/fb/mb/tvt/tvt-Dateien/tvt_en.html	
Faculty Mentor:	Prof. Dr.-Ing. Manfred J. Hampe	
Faculty Mentor Email:	hampe@tu-darmstadt.de	
Graduate Mentor:	Dipl.-Ing. Stefanie Roessner	
Graduate Mentor Email:	roessner@tvt.tu-darmstadt.de	
Project Description:	Ionic liquids are non-volatile substances with virtually no vapor pressure. They may be used as liquid pistons in devices that expand compressed gases and recover mechanical energy. The research project is on the design of a machine for on-board recovery of mechanical energy from compressed hydrogen.	
Jun 9 - Aug 1, 2008; (8 weeks, 40h/week)		
Necessary Skills/ Knowledge:	<ul style="list-style-type: none"> • Thermodynamics 	
Desirable Skills/ Knowledge:	<ul style="list-style-type: none"> • Ability to work independently • Experience in engineering design 	
Additional Online Resource(s):		

NSF REU Students must have completed at least two semesters of engineering studies prior to the proposed summer research, and they must have at least one semester remaining before they can earn their BS in Engineering.