Dr. Michael Fowler
Chemical Engineering - University of Waterloo

Current Testing Facilities

- Two Hydrogenics Test Stations (800 Watt), plus one locally built test station (Single Cell)
- Two more stations used as undergraduate labs
- Benchtop integration of 1.5 Kwatt systems
- Two stations with AC impedance (Solartron 1260, Autolab)
- Material Analysis Capabilities

Students and Projects

Primary Research Project	Students	Notes
Conductive Polymers		
Conductive Polymers/Plate Manufacturing	MScEng 06 – Taylor Mali MScEng 06 – Cathy Wang One Forth Year Project	Build Cell / Plates Blend Polymers Mold Mix Analysis of Percolation Theory
Membrane Electrode Accessibly **MEA - Construction/Reliability**		
Catalysis Layer / Membrane Reliability	PhD 08 - Sumit Kundu Co-Supervisor Simon Post Doc - Dec 2005 – Dec 2006) Ms Park (From Sogang University sponsored by South Korea) PhD 07 – Kasetsart University Amaraporn Kaewchada Supervisor - Sunun Limtrakul Exchange Student 2005 - 2006	Testing and Model of an MEA Failure Modes of an MEA Solid Modeling of a MEA Innovative MEA Electrode Design
GDL/Electrode Interface Study	PhD 07/08 – Jeff Gostick Co-Supervisor Dr. Pritzker MSc 07 – Kasetsart University Nattawoot (Natt) Limtrakul Supervisor - Sunun Limtrakul Exchange Student 2005 - 2006	Electrode Model (mass transfer and kinetics) GDL Mass Transfer (two phase flow) model and development of experimental protocol (porosity and mass transfer testing) Micro Cell for Operation in an NMR
Membrane Testing for a Fuel Cell Humidifier	MScEng 07 Ryan Huizing With an Industrial Sponsor	Membrane testing and Durability Evaluation Design of a fuel cell hydrator
MEA Durability in a Stack	MScEng 05 -Kwok Wai Chan (Graduated Sept 2005) With an Industrial Sponsor (Stack testing did on site at industry)	Performance Study Comparison of Two MEA Types Durability Study with MEAs

Fuel Cell Systems Projects		
Automotive Power Module Model (Hybrid Platform Modeling)	PhD 08 – Matt Stevens	ChallengeX – 65Kwatt Hydrogenics fuel cell power module system on a GM Equinox Test and Install Model of System May require a test bench
Fuel Cell System Control	MScEng 07 – Erik Wilhelm	ChallengeX Fuel Cell Control, and bench set-up a 65Kwatt Hydrogenics power module
Gas Infusion Fuel Cell	MScEng 05 – Lin Qui Graduated Sept 2005	Innovative Hydration and Operation of a Fuel Cell with the use on industrial sponsor's Gas Infusion device Innovative Cell Designs to improve the performance
H2DeeP – Diver Propulsion Unit – Sea Scooter	Student Team	Integration of a 800 watt fuel cell stack on a Sea Scooter
1 – 5 kWatt Fuel Cell Electrical Power System Design and Operation	Support to Dr. Ehab El-Sadaany and Dr. M. Kazerani – Electrical Eng for Test Station Balance of Plant	Three stacks (1.5 kWatt, and two 1.2 kWatt) stacks to be operated in parallel. 1.2 Kwatt Nexa, and 1.5 Anuvu. Electrical Research process to test load interfaces Supporting with Balance of Plant development
SOFC	Gradated PhD 05 – Rapeepong Suwanwarangkul Co-Supervision - Croiset	Modeling and Synthesis Gas Operation With Dr. Croiset also SOFC Test Station Construction
HYDROGEN DISTRIBUTION		
Hydrogen Production and Distribution System	4th year Projects	Location of Hydrogen Stations in Ontario LCA – Well to Wheel Hydrogen , Production, Storage and Delivery System Installation Selection and Installation of Hydrogen Storage and Distribution as hydrogen 'Node'
Hydrogen Retail Station	Undergraduate Team	Design of a Hydrogen Retail Station Hydrogen Retail Station Design – National Hydrogen Association Competition (H2U) - Hazop - Safety Code - CO2 analysis Seeking to Improve on 2005 Honourable Mention finish

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