

Parametric Design Studies on A Direct Liquid Feed Fuel Cell

by

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Parametric design studies were carried out on a direct methanol liquid feed fuel cell employing 1 M MeOH fuel, air and oxygen as oxidant in a 2 inch x 2 inch cell employing polymeric electrolyte membranes (PEM). The polymeric electrolyte membrane assemblies (membrane with attached electrodes) were prepared by Giner Inc. , Waltham, M.A. and the polymeric membrane materials (membranes alone) were ~~made~~ prepared by duPont, Wilmington D.E.. The work included measurement of voltage-current output characteristics, methanol crossover rate, and impedance as a function of several design and operational variables. The design variables included PEM thickness, equivalent weight, and composite PEM's. Operational variables included temperature and oxidant flow rate. Baseline output was 300 mA/cm² at 0.5 V with 1 M MeOH and oxygen at 20 psig with 60 to 70°/0 fuel utilization. Output can be increased with increase in temperature and without reduction in MeOH utilization for some membranes, This work was sponsored by the Advanced Research Projects Agency.

Neither this paper nor any version close to it has been/is being offered elsewhere for publication and, if accepted, an author will attend the Fourth Grove Fuel Cell Symposium and participate in the poster session.

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