

Over Potential Reduction in Direct Methanol Fuel Cells

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We propose the fabrication of porous bipolar plates for direct methanol fuel cells. The objectives are to produce lightweight, low interface resistance, high thermal conductivity, and high current carrying bipolar plates. The design is based on commercially available porous carbon with typical pore size between 100 – 150 microns. The porosity of the carbon is utilized as micro-channels for fluid flow (methanol and air). To further reduce contact resistance, and overall weight, the porous bipolar plate will be processed to replace the gas-diffusion layers in the fuel cell. This is to be done by growing a thin carbon film of between 5-10 microns on the surface of the porous plates using RF sputtering deposition processes.

The overall target for this project is to achieve a 25% reduction in weight compared with what is currently reported for a 150-Watt portable direct methanol fuel cell.