

# Modeling of a Direct Methanol Fuel Cell

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## Abstract

This work aims at the modelling of a 5 cm<sup>2</sup> Direct Methanol Fuel Cell (DMFC) with mixed serial/parallel serpentine flow fields in terms of current/voltage behaviour. One of the main challenge to overcome consists on lowering the so-called methanol cross over from the anode through the polymer membrane to the cathode that is responsible for mixed-potential formation at the cathode where both reactions namely oxygen reduction (ORR) and cathodic methanol oxidation (MOR) simultaneously occurs and affects electrochemical performances. All modelling steps have been carried out by using COMSOL Multiphysics® software and especially the Batteries & Fuel Cells Module. Influence of dependent variables such as cell temperature and methanol concentration on current/voltage characteristics will be presented. One typical current-voltage characteristic is presented in Figure 1.

## Figures used in the abstract

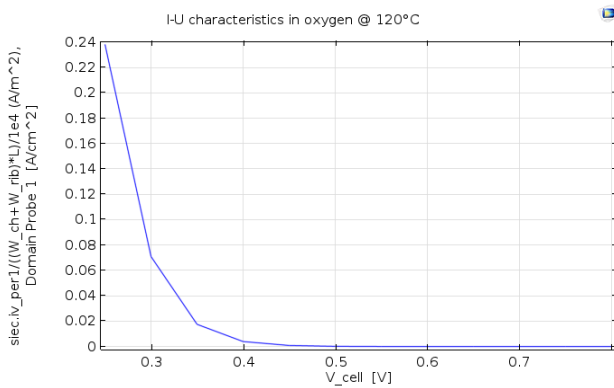


Figure 1: I-U behavior of DMFC simulation.