Fuel Cell Stack Opeation: Exploring Inhomgeneous Cell Polarization

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Abstract

Cell interaction phenomena in fuel cell stacks that arise from inequalities between adjacent cells are investigated in detail experimentally. For that, a specialized 2-cell stack with advanced localized diagnostics was developed. The results show that inequalities propagate by electrical coupling, inhomogeneous cell polarization and inducing in-plane current in the common bipolar plate. The effects of the different loss-mechanisms are analyzed on a theoretical [1] and experimental basis [2].

1. S.M. Senn and D. Poulikakos, *Multistage polymer electrolyte fuel cells based on nonuniform cell potential distribution functions.* Electrochem. Comm., **7,** 773-780 (2005)
2. F.N. Büchi, S.A. Freunberger, and M. Santis, *What is Learned Beyond the Scale of Single Cells?* ECS Transactions, **3,** 963-968 (2006)