

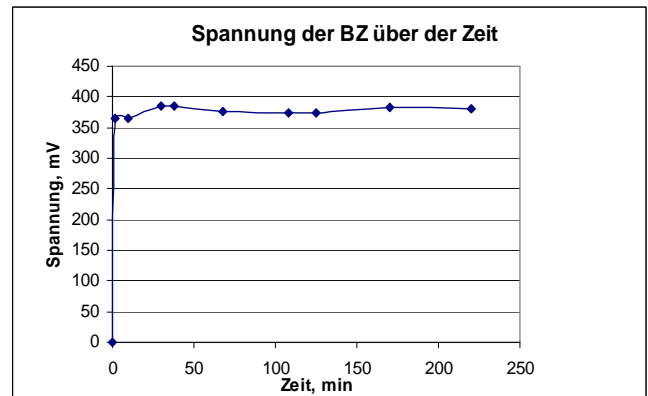
Project Information

Subject: Development of a new electrolyte for the employment in fuel cells

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Project Duration: 1.6.2006 – 31.05.2007

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Voltage of the fuel cell after 25 hours of operation

Project description:

Despite the generally acknowledged advantages which PEM fuel cells containing Nafion as electrolyte membrane have, there are also some disadvantages. The major disadvantage is their temperature sensitivity, which limits them to low operating temperatures. This is the main reason why the necessary catalysts are sensitive to poisoning by e.g. carbon monoxide. Furthermore the polymer membrane always has to be moistened. This requires a sophisticated water management in the fuel cell.

In the research project, the basis of a new fuel cell concept shall be compiled. This new fuel cell shall no longer exhibit the disadvantages mentioned to be characteristic for the PEM fuel cell and offers a further alternative to Nafion as an electrolyte. The new concept consists of a combination of full metal catalysts, which as well are employed as cathode and as anode, and a zeolite, which is used as electrolyte. Like the PEMFC, the new fuel cell, at first designed as a tubular reactor with 100mm length and a diameter of 10mm, is operated with hydrogen and atmospheric oxygen. The advantages arise as a result of the distinct temperature stability, the high CO tolerance of the catalyst and the simplified water management of the fuel cell arrangement. In order to establish its acidic characteristics, the zeolite built into the fuel cell, has to be dampened only once.

The experiments show that it is possible in principle to use zeolites as alternative electrolytes in fuel cells. The voltage received with the simple fuel cell construction is stable over a longer period.

The proceeding work concerns the optimization of the electrical connections and the air supply as well as the accurate determination of the received electrical power.



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