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A Hydrophobic Layer-based Water Feedback Structure for Passive μ -DMFC

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Abstract: In recent years, micro-direct methanol fuel cells (μ DMFC) with high energy density, environmental protection features, rapid start-up, mild operating conditions, and convenient fuel storage have become a research hotspot. Some difficulties must be overcome in order to realize the application of the μ DMFC as one of the newest types of portable energy. Currently, water management is one of the main problems researched in the field of μ DMFC. Therefore, we propose a new cathode water-feedback structure to alleviate the hazards of water flooding. We designed a new cathodic support layer with stainless-steel fiber felt as the base material and carried out hydrophobic treatment on the exterior of the cathode. The influence of this composite material on the cathodic water management system is investigated, and the design scheme of this new structure is verified. Effective water management is verified by comparing photographs of the water flooding phenomenon on the cathode side. By analyzing the polarization curves and discharging curves, we

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