Numerical investigations of water crossover effect of membrane electrode assembly in DMFC

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A two-phase mass transport model for liquid-feed direct methanol fuel cell (DMFC) has been developed. Experimental data for validation of the model was taken from the published literatures. The Developed model shows good agreement on cell performance with experimental data. Employing present model, water transport behavior through the membrane electrode assembly by considered of a DMFC. Water crossover appearance due to three mechanisms : electro-osmotic drag force, diffusion and convection. The results show that cell performance and water crossover predicted due to current density increment. And then various operating conditions are investigated to evaluate the effect on DMFC performance. It is found that the reduction in the diffusion flux of water can be mainly achieved through optimum design of the anode porous layer.