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Title: Electerochemical Study of Speek/Cloisite 15A®/TAP Membrane at Moderate Temperature for DMFC Application

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Abstract: This study was to investigate the properties of the sulfonated poly(ether ether ketone) (SPEEK) nanocomposite membranes filled with Cloisite 15A® clay, in the presence of 2,4,6 triaminopyrimidine (TAP) as a compatibilizer. The membranes were prepared via solution intercalation method, before they were subjected to performance tests in the temperature range of 27 to 80 oC for comparison with Nafion® 117. The SPEEK membranes were then utilized to measure the open circuit voltage (OCV) and power density for direct methanol fuel cell (DMFC) applications in the temperature range of 27 to 60 oC. The best data obtained, among all the tested membranes, were methanol permeability of 0.52 ×10-6 cm2s-1 and proton conductivity of 47 mScm-1 with the methanol selectivity of 9.1 × 104 S.s.cm-3, even at a high temperature of 60oC.