

Oxidation durability enhanced sPEEK with cerium/18-crown-6-ether complex for PEMFC application

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(djkim@skku.edu*)

The effect of cerium ions (Ce^{3+}) on the anti-oxidation and other properties of sulfonated poly(ether ether ketone) (sPEEK) was studied, as it quenches the hydroxyl radicals, the major oxidation promoter in fuel cell operation. Cerium was introduced along with 18-crown-6-ether to form a coordination complex to prevent both the migration of Ce^{3+} ions from the membranes and the direct interaction with sulfonic acid groups in sPEEK. The structure of composite membranes were investigated using FT-IR, 1H NMR, SEM, EDX, and SAXS. Other properties of membrane such as wateruptake, mechanical stability, ion conductivity, and etc. were measured.