

The degradation mitigation effect of cerium/18-crown-6-ether complex hydroxyl radical quencher on electrodes layer in fuel cell durability test

양성우, 김덕준[†]

성균관대학교

(djkim@skku.edu[†])

Degradation mitigation effect of cerium/18-crown-6-ether complex in electrodes layer was studied, as it quenches the hydroxyl radicals, the major oxidation promoter in fuel cell operation. Cerium (Ce) was introduced along with 18-crown-6-ether to form a coordination complex to prevent both the migration of Ce³⁺ ions from the electrodes and the direct interaction with sulfonic acid groups in binder materials. In this work, cerium/18-crown-6-ether complex was incorporated into electrodes layer in perfluorosulfonic acid based membrane electrode assembly(MEA) and their ability to improve the in-situ membrane durability was studied by subjecting them to 100h open-circuit voltage hold accelerated durability tests. In these tests, the open-circuit voltage decay rate, The limiting current density for hydrogen crossover, cell performance, membrane resistance, and electrochemical active surface were carried out to investigate.