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Short communication

Improving MEA durability by using surface-treated catalysts

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Abstract

In order to improve the durability of membrane electrode assemblies (MEAs), surface treatments of carbon-supported Pt catalysts are studied. When treating catalysts with amines, especially hindered amine light stabilizers (HALS), durability testing of an MEA drastically improved. The amino groups in the molecule of HALS are considered to react with carboxyl groups on carbon support to form complexes. It was confirmed that hydrogen peroxide formation is retarded in the case of HALS-added catalyst by using a hydrogen peroxide test paper. Together with the results of the catalyst surface treatments using nitric acid and dehydrated ethanol, it was clarified that surface functional groups, carboxyl and/or hydroxyl groups, on the carbon support play an important role in the generation of hydrogen peroxide during fuel cell operation.

Keywords: MEA; Durability; Surface-treatment; Catalyst; Functional-group