Study on Accelerated Stress Test for Fuel Cell Lifetime

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A practical accelerated stress test (AST) has been established to analyze the fuel cell durability in this work, which combines the actual operated conditions in fuel cell vehicle. And the durability of two MEAs with different Pt loadings have been studied via this AST. The results show that this AST could effectively decay the MEAs in a short time. After cycling, the thicknesses of the catalyst layers (CLs) reduce and the sizes of the Pt particles grow up compared to the fresh one. The performance decay is mainly attributed to electro-chemical surface area (ECSA) degradation in this work. And in our experiments and experience, ECSA less than 100 cm²/cm² is speculated to be not conducive to stable performance for fuel cell.

Keywords: MEA, durability, accelerated stress test, ECSA, particle size

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