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Surface Modification of SUS-304 Using Nitriding Treatment for Application of Bipolar Plates of Proton Exchange Membrane Fuel Cells

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Abstract : Proton exchange membrane (PEM) fuel cells are widely used in electrical systems as an economical, low-polluting energy source. This study investigates the effects of PEMFC gas nitriding treatment on metal bipolar plates. The test material was SUS304 stainless steel. The study explored five different pretreatment processes, varying the corrosion resistance and electrical conductivity conditions. The most effective process was industrial acid washing, followed by heating to 500 °C. Under the condition, the corrosion current density was 8.695 μA, significantly lower than that of the untreated pretreatment sample flakes, which was measured as 38.351 μA.

Keywords : nitriding, bipolar, 304, corrosion, resistance, pretreatment
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