

표면개질에 의한 스테리스강의 내식성 향상

Improvement of Corrosion Resistance of Stainless Steels by Surface Modification

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Stainless steels have been widely used as corrosion resistant materials in atmospheric conditions but they show poor corrosion resistance in certain conditions such as chemicals and chloride solution. Recently stainless steels have been investigated largely for bipolar plate in fuel cells where highly corrosion resistive metallic materials with low electrical resistivity and low cost are needed. A number of coating materials have been tested for protection of metallic bipolar plates to achieve high corrosion resistance and low cost, but still no coating materials satisfy commercial targets.

In this work, corrosion resistance of stainless steels was improved by surface modification and tested in sulfuric acid and chloride solutions. Corrosion rate of stainless steels was lowered significantly by newly developed surface modification method in sulfuric acid and chloride solutions. The corrosion rate of surface-modified stainless steel was about 10^{-6} A/cm² at 80 °C in 1M H₂SO₄ + 2 ppm HF, which is very close to the target for bipolar plate for polymer electrolyte membrane fuel cell.

References

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