

Variations of micro-morphology and micro-structure of fluorine-doped tin oxide (SnO_x:F) film coated steel on the influence of hydro-acid reaction

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The conductor oxide film coated steel was used the bipolar plates for fuel cell. So, the steel was coated with fluorine-doped tin oxide by electron cyclotron resonance-metal organic chemical vapor deposition at low temperature. The heat treatment of substrate performed after the deposition of fluorine-doped tin oxide film. The results showed that an fluorine-doped tin oxide coating enhanced the corrosion resistance of the steel in bipolar plates of fuel cell, though the substrate steel has a significant influence on the behavior of the coating. And, effect of H₂/Ar plasma treatment on steel for bipolar plate steel of fuel cell before the coating process of film was obtained the clean surface of steel. Coating steel for bipolar plates steel of fuel cell further improved the already excellent corrosion resistance of this steel. But it has weakly decreased the efficiency and conductivity of fuel cell due to the behaviors of crack and separation by strong hydro-acid reaction. The behaviors of crack and separation of the conductor oxide film coated steel has observed micro-morphology and micro-structure at strong hydro-acid reaction.