عنوان مقاله:

Study of the Electrochemical Behavior and Lifetime of DSA Electrodes Including IrO۲, Ta۲O۵, SiO۲

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خلاصه مقاله:

The Ti/IrO۲-Ta۲O۵ electrode was well performed as a mixed metal oxide for the oxygen evolution reaction. In the industry, the high price of its fabrication caused its utilization to be limited. In the present work, to reduce the cost, low-content IrO۲-included electrode was used in producing electrodes so that they did not show lower performance for the catalytic oxygen revolution reaction. Ti/IrO۲-Ta۲O۵-SiO۲ electrode was prepared by the solgel method of iridium chloride, tantalum chloride, and tetra ethoxy orthosilicate salts at ۴۳۰ C. Doping silicon oxide and tantalum oxide to the electrode increases the corrosion resistance in acidic media. The surface morphology of the electrode was evaluated by SEM and EDAX. Furthermore, the stability of the electrode was investigated for use as an anode in the electrowinning system of copper, in ۰.۵ M sulfuric acid at ۳۰ C and under a constant current of ۱.۵ Acm-۲, as a function of the electrolysis time during the ALT. The results indicated that the prepared electrode had a stability of ۱۷۳ h in the sulfuric acid solution. Moreover, the electrocatalytic activity of the electrode during the stability test was studied by the cyclic voltammetry. It was found that with the penetration of the electrolyte into the coating, the amount of electrical charge increased to ۷۰.۲ mC.cm-۲, whereas it decreased to ۳۱.۴ mC.cm-۲ with the electrode degradation.

کلمات کلیدی:

Mixed metal oxide, Oxygen evolution reaction, electrowinning, tantalum oxide,
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