Electrochemical Properties of Graphene Modified Ti/IrTaSnSb-G Mixed Metal Oxide Anodes in Low Temperature And Low Salt NaCl Solution

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Abstract Graphene-containing Ti/IrTaSnSb-G anodes were prepared by thermal decomposition. The electrochemical performances of the anodes in 1.5% NaCl solution were tested and microscopic morphology analysis by SEM and EDS was conducted, while the effect of graphene on the properties of the anodes was studied. The results show that the graphene promotes the segregation of IrO_2 with dendritic structure on the surface of the anodes, and secondary crystallization phenomenon was found to produce the nano-needle structure of IrO_2, which increased the active surface areas of the anodes and improved the electro catalytic activity of the anodes. Furthermore, the electrolysis current efficiency of the electrode with graphene content of 0.6g/L increases 9% and 13% respectively in the NaCl solution of low temperature and low salt. However, excessive amount of graphene lead to the decrease of IrO_2 on the surface of the anodes and the reduction of the electrochemical activity.

Keywords graphene; oxide anode; electrochemical activity; current efficiency

Reference

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